



Everything connects

JoAnne Growney

To cite this article: JoAnne Growney (2020) Everything connects, Journal of Mathematics and the Arts, 14:1-2, 66-68

To link to this article: <https://doi.org/10.1080/17513472.2020.1729302>



Published online: 26 Jun 2020.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



Everything connects

JoAnne Growney*

Emeritus Professor of Mathematics, Bloomsburg University of Pennsylvania, Silver Spring, MD, USA

ARTICLE HISTORY Received 1 October 2019; Accepted 10 February 2020

KEYWORDS poetry; mathematics; everything connects; art; 'Intersections – Poetry with Mathematics'

Girls who change
lightbulbs change
everything.

Most art involves creation of new objects – theories and proofs, sculptures and paintings, essays and poems. However, another aspect of art is making connections – an area where much of my activity lies. I have created mathematics and created poems and, in recent years, I also have written about poetry and mathematics as companion arts and about how they connect.

Many aspects of my life have been influenced by both mathematics and poetry. I grew up on a farm. I loved reading and reciting from *A Child's Garden of Verses* by Robert Louis Stevenson – which was one of just a few books on our farmhouse shelves. And there were lots of activities with crops and animals that involved counting and arithmetic and area and volume – and problem-solving.

Raised to be a hard worker, I became proficient at mathematics in a time when girls were considered not as smart as boys. Though I tried to find time for literature and creative writing in college, my mathematics scholarship paid my way – so math and the sciences needed my first attention.

One of the hypotheses that has guided me over the years – and may even be linked to my brain structure – is 'Everything connects'. Looking for connections seems to be what I do. And, since I am interested in both mathematics and poetry, these form a pair for which I seek relationships. Years ago, in my doctoral dissertation at the University of Oklahoma, I found links between the counting of rhyme schemes and the Catalan numbers. In my teaching at Pennsylvania's Bloomsburg University, I found that poems offered a concise way to highlight attitudes toward math and to introduce important people in math history to my students. When I found time to take poetry classes, I became aware of the important ways that counting and permutation help to create poems such as the sonnet and the pantoum, the limerick and the sestina. As the internet stretched the horizons of my knowledge, I became acquainted with the OULIPO (*Ouvroir Littérature Potentielle*) and that group's collection of often-mathematical constraints. Syllable-counting structures such as snowballs and squares and Fibs limit word choices so that, when I write in support of women's rights

CONTACT JoAnne Growney ✉ japoet@msn.com

*Present address: Blogger at <https://poetrywithmathematics.blogspot.com>

© 2020 Informa UK Limited, trading as Taylor & Francis Group

or with grave concern about climate change, I am pushed to think carefully and not simply to rant. Moreover, these same structures have offered guidance to my students who explore expression of their ideas in verse. Composing brief poems to meet specified syllable counts can supply focus that helps new poets to find words – to express their anxieties or their joys or As for me, often I write to discover – to find things I could not know until my fingers wrote them.

As samples of my opinionated (and also constrained) writing, here are two square stanzas that are part of a collection, ‘Give Her Your Support’, appearing in the [April 2019 issue of Math Horizons](#).

Little Women	What Math Teachers Do
In school, many gifted math girls. Later, so few famed math women.	They ignore me. I raise my hand—wave it to ask questions, to offer answers—but they call on the boys!

Both mathematics and poetry are ways of communicating that can say a lot in a few symbols – and they also are languages in which many concepts can be used in multiple ways. Striving toward elegance and beauty also is common in both of these arts.

In recent years (since 2010) I have used my background and love for both mathematics and poetry to produce a blog: ‘Intersections – Poetry with Mathematics’ – and now there are more than a thousand postings (found at <https://poetrywithmathematics.blogspot.com>). Besides offering examples for mathematical and literary enjoyment, the blog offers a resource for teachers and students. Some of its poems offer ways to express and understand wide-ranging attitudes and anxieties. In addition, biographical poems (findable using the blog’s SEARCH feature) offer brief but important ways to enrich classes with the history of mathematics. Back in the 1980s I wrote a poem entitled ‘My Dance Is Mathematics’ – about the discrimination faced by Emmy Noether; here are its final lines:

Today, history books proclaim that Noether
is the greatest mathematician
her sex has produced. They say she was good
for a woman.

The following poem, ‘We Are the Final Ones’, illustrates the process of using a mathematical pattern to impose structure on a vital message. The poem was on view at the 2015 Bridges MathArt Conference – paired with art by Allen Hirsch, artist and biophysicist; the art is available [here](#), and the poetry inspired by the art is accessible by clicking on [Link](#) beneath each painting.

The structure of the poem above comes from *The Fundamental Theorem of Arithmetic* (which tells us that each integer greater than 1 can be expressed as a product of primes – and, except for possible variations in the orders of the primes, this expression is unique). Within the poem each line, starting with the title, is paired with a counting number – 1, 2, 3, and so on through the number 21. If the line-number is a prime, then the line includes a single a new statement; if the line number is not prime, the phrases corresponding to its prime factors are used. For example, line 6 combines lines 2 and 3 with the connector ‘and’ standing in for multiplication – giving us the composite statement, ‘we breathe dirty air’

We Are the Final Ones

we breathe dirty air
 coral reefs die
 we breathe dirty air as we breathe dirty air
 storms are extreme
 we breathe dirty air and coral reefs die
 climate change affects the poor first
 we breathe dirty air as coral reefs die
 coral reefs die as we breathe dirty air
 we breathe dirty air and storms are extreme
 we drive instead of walk
 we breathe dirty air as we breathe dirty air and coral reefs die
 drought is a serial killer
 we breathe dirty air and climate change affects the poor first
 coral reefs die and storms are extreme
 we breathe dirty air as we breathe dirty air as we breathe dirty air
 What will happen to the polar bears ?
 we breathe dirty air and coral reefs die as we breathe dirty air
 trash piles grow
 we breathe dirty air as we breathe dirty air and storms are extreme
 coral reefs die and climate change affects the poor first

application of *The Fundamental Theorem of Arithmetic* to construction of a poem by JoAnne Growney

and 'coral reefs die'. The connector 'as' is used for exponentiation and, since $8 = 2^3$, in line 8 the resulting statement is this: 'we breathe dirty air' as 'coral reefs die'. And so on – through line 21.

I close with a Fib (that is, a six-line poem whose syllable counts match the first six Fibonacci numbers):

Pick
 up
 your pen.
 Think of ways
 that math is magic.
 Shape your words into a poem

Disclosure statement

No potential conflict of interest was reported by the author(s).