



**Haiku,
Piku...Creative
Writing in
Mathematics –
an Oxymoron?**

CMA Conference 2017

Creative writing...What does that suggest to you?

- Poetry?
- Telling a story?
- Making something up?
- Fiction and non-fiction?

- ...and nothing really to do with maths!





It's your turn to start with...

- Respond honestly to each of the following questions or statements.
- Consider one of your students that you've worked with over the past few days – what might that student have written. Why?
- Imagine you are your 15-year old self again. You are back in your Maths classroom at school. Suddenly, Hedwig flies in through the window and drops a letter into your lap. It is from your future self (the 'now' you), and contains three pieces of advice from the *now you* to *then you*. Given the benefit of hindsight, what might you write?

What does mathematics represent to you?



- What colour is maths? Why?
- If maths were a food, what would it be and why?
- Which day of the week do you associate with maths? Why?
- If you could be represented by a number, what would it be?

What is the taste of maths?

- “Maths tastes like the satisfying crunch of chips when you answer all the questions right, however, sometimes Maths transforms its flavour into a red, hot, burning flame of a chilli when no matter how hard you try, all you see are symbols on a page, and nothing seems to make sense.” (Angelina, Yr 8)
- “Like cardboard(...?) and coffee.” (Lily, Yr 8)
- “Seaweed.” “Salt.” “Blue cheese” (Yr 8)
- “Something like the taste of black coffee – when you’re younger you avoid it like the plague, but you may grow to like it with time.” Peter (Yr 8)
- “The taste of maths is like a sour strap. As you are doing it it is a bit sour, but when you’re done it’s sweet.” (Alana, Yr 8)

- “Jelly beans because you’re not sure what you’ll get.” (Tyler, Yr 7)
- “I do not know. I just know that maths can be very filling because numbers go on fo infinity.” (Huy, Yr 7)
- “At first maths taste sour and bitter as it seems complicated. But when one understands more of the problem maths suddenly tastes spicy, and getting the urge to want more. As the individual starts to have an idea to figure out the problem, maths gets extremely hot and spicy and the solver gets drastically active using all energy needed to solve the problem and once solved, maths cools down and tates sweet, wanting to have more”. (Duong, Yr 7)

Food For Thought, Sandra Frid, AMT57(1)

The use of the analogy of food to examine the nature of students' experiences in the learning of mathematics:

- An entrée – student perspectives
- The main course – a full plate of learning possibilities
- Persistence alongside appropriate sized pieces
- Experience and ongoing efforts
- Frustration and the 'facts of life'
- Different things to different people
- The dessert – some additional tasty possibilities

More analogies to use...

- What does using or doing maths feel like?

"Skiing on blue ice, with no edges, blindfolded."

- If maths were a way to travel what means of travel would it be?

" A leaky boat – because you'll never reach your destination."

- How is learning mathematics like learning to surf or to play tennis, or to play a musical instrument?
- How is it like the TV show *Friends* or a James Bond movie?

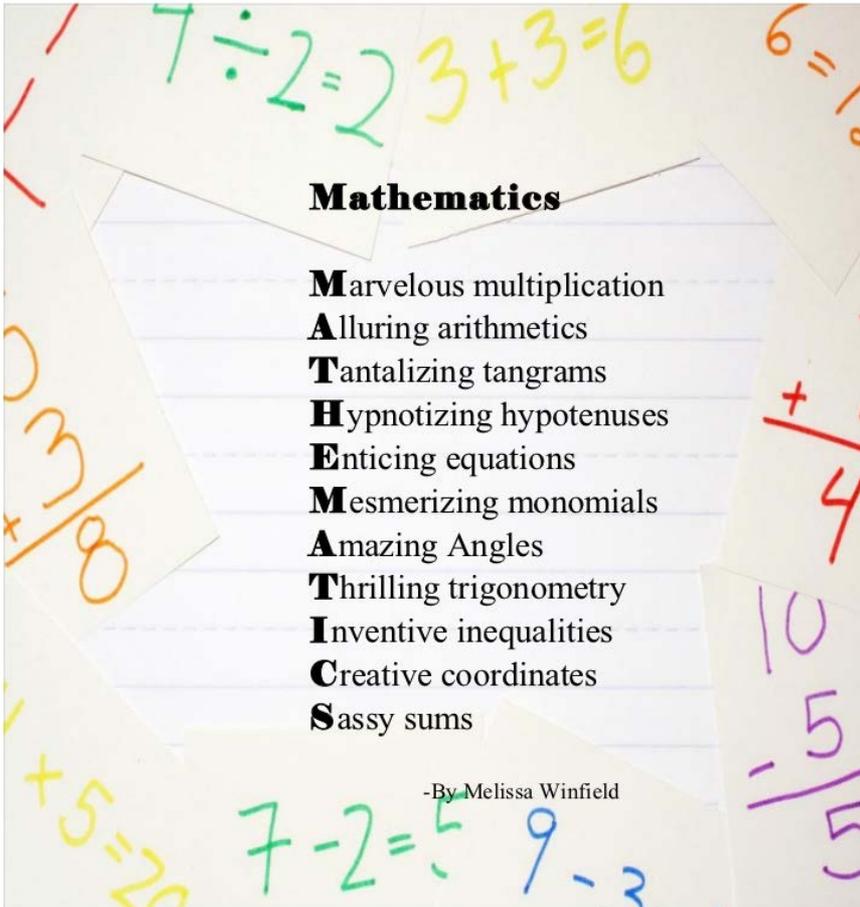
Black Holes and Beginning Teachers

Jude Ocean & Barbara Miller-Reilly AMT 53(4)



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An Acrostic

Other themes?

Algebra

Geometry

Graphs

The calculator

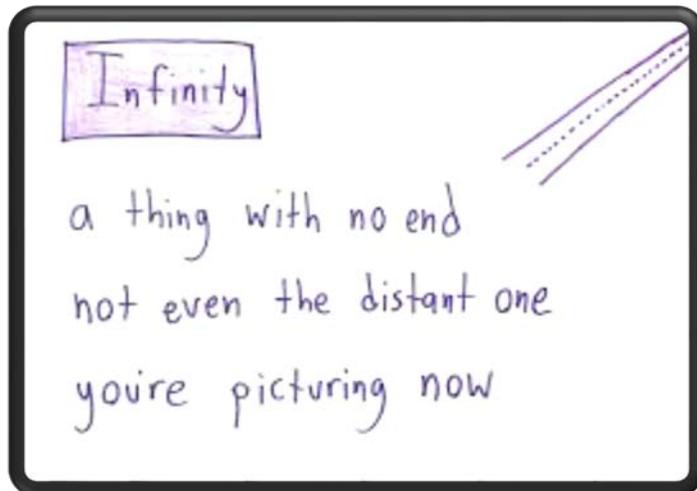
Solving equations

Trigonometry

...Sometimes the more specific the subject matter is, the more 'creative' the writing will be.

Constrained writing (1)

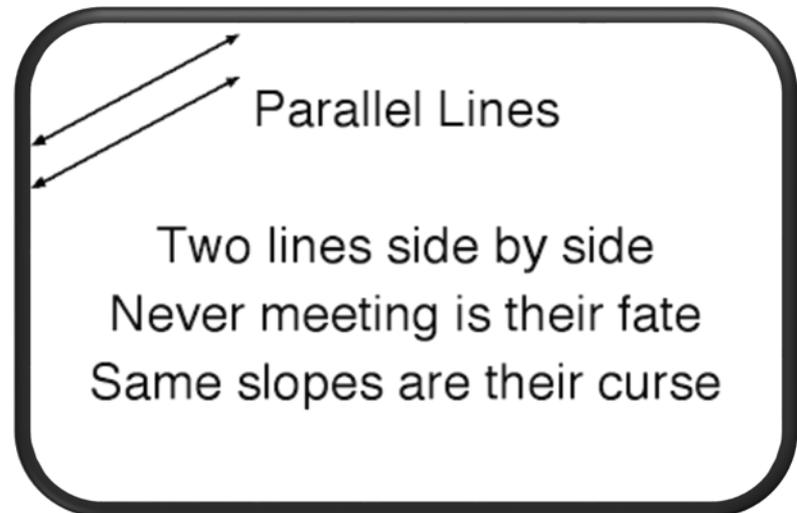
Haiku A Japanese form: 3 lines, with a 5-7-5 syllabic structure



A handwritten haiku on a white background with a black border. The word "Infinity" is written in a purple box in the top left. To the right, there are two parallel lines with arrows at their ends, one solid and one dashed. The haiku text is written in a cursive, purple font.

Infinity

a thing with no end
not even the distant one
you're picturing now



A diagram showing two parallel lines with arrows at their ends, labeled "Parallel Lines". Below the diagram is a haiku text.

Parallel Lines

Two lines side by side
Never meeting is their fate
Same slopes are their curse

Math Haiku

$$1+ - 9$$

$$\sqrt{(-9)}$$

$$1^2 + 2^2$$

© 2010 Apple Inc.

Sciku

The Wonder of Science in Haiku.

Students of the Camden School for Girls (2014)

Scikological barriers

To explain science
In seventeen syllables
is really quite hard

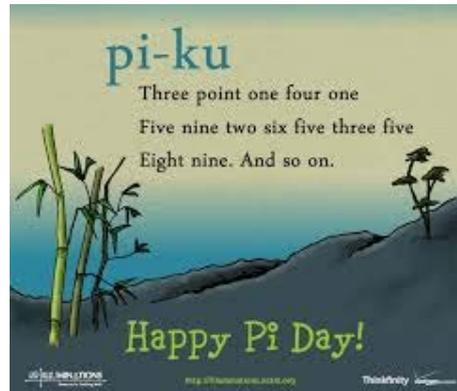
Chhaya Lad

Newton Thinking

A fallen apple
Eureka, it's gravity!
Shame about the bruise.

Anonymous

Piku



While you memorized
Forty-nine digits of pi,
I ate the last slice.

Hungry for π 3rd

I am so hungry
I think I could eat four pies
or three point one four

by Maxwell Bennett-Wamble

An alternative is to use 3 lines with the syllabic structure 3-1-4

Other simple poetic forms:

- The Cinquain

triangles
pointy edges
revolving, rotating, angling
Triangles are all different.
180°

Handout – An (American) example of how *formulaic poetry* might be used in the classroom.

Constrained writing (2)

Can you write a paragraph without the letter 'e'?

I doubt I can. It's a major part of many, many words. Omitting it is as hard as making muffins without flour. It's as hard as spitting without saliva, napping without a pillow, driving a train without tracks, sailing to Russia without a boat, washing your hands without soap, or shitting without a butt. And, anyway, what would I gain? An award? A cash bonus? Bragging rights? Why should I strain my brain? It's not worth doing. Now, a grammatical paragraph without commas: that would wow most folks on Quora, don't you think? Could *you* do it? If so, I tip my hat to you—or I would if I had a hat. Or, how about a paragraph without punctuation? Or a paragraph without nouns? If you can do that, you'll win my admiration. Go on. Try! I'm waiting...

Piems, Pilish writing and Piphilology

- **Piem (Pi/Poem)** A poem that represents π in a way such that the length of each word (in letters) represents a digit.
- **Pilish writing** is a prose form, often extended, with the same constraints.
- **Piphilology** comprises the creation and use of mnemonic techniques to remember a span of digits of π

How I wish I could calculate pi!

The Cadaeic Cadenza (Mike Keith)

is a short story of about 4000 words composed in Standard Pilish, in which the length (in letters) of successive words in the story "spells out" the digits of the number π - in this case, the first 3835 digits. In the spirit of Oulipo (a group of writers of constrained content), the constraint is reflected in the story itself: its narrator discovers that all the books in the world have suddenly been transformed into Pilish. In order to illustrate this for us, the readers, excerpts from the Pilish version of several works of literature are included in the story.

Cadaeic Cadenza held the record for the longest Pilish text from 1996 to 2010, until the publication of his book Not A Wake, which now holds the record of 10,000 digits.

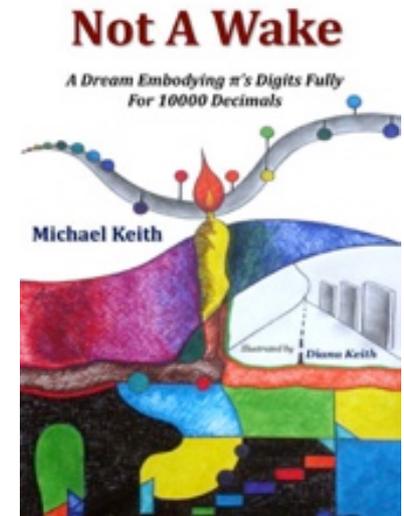
<http://www.cadaeic.net/cadintro.htm>

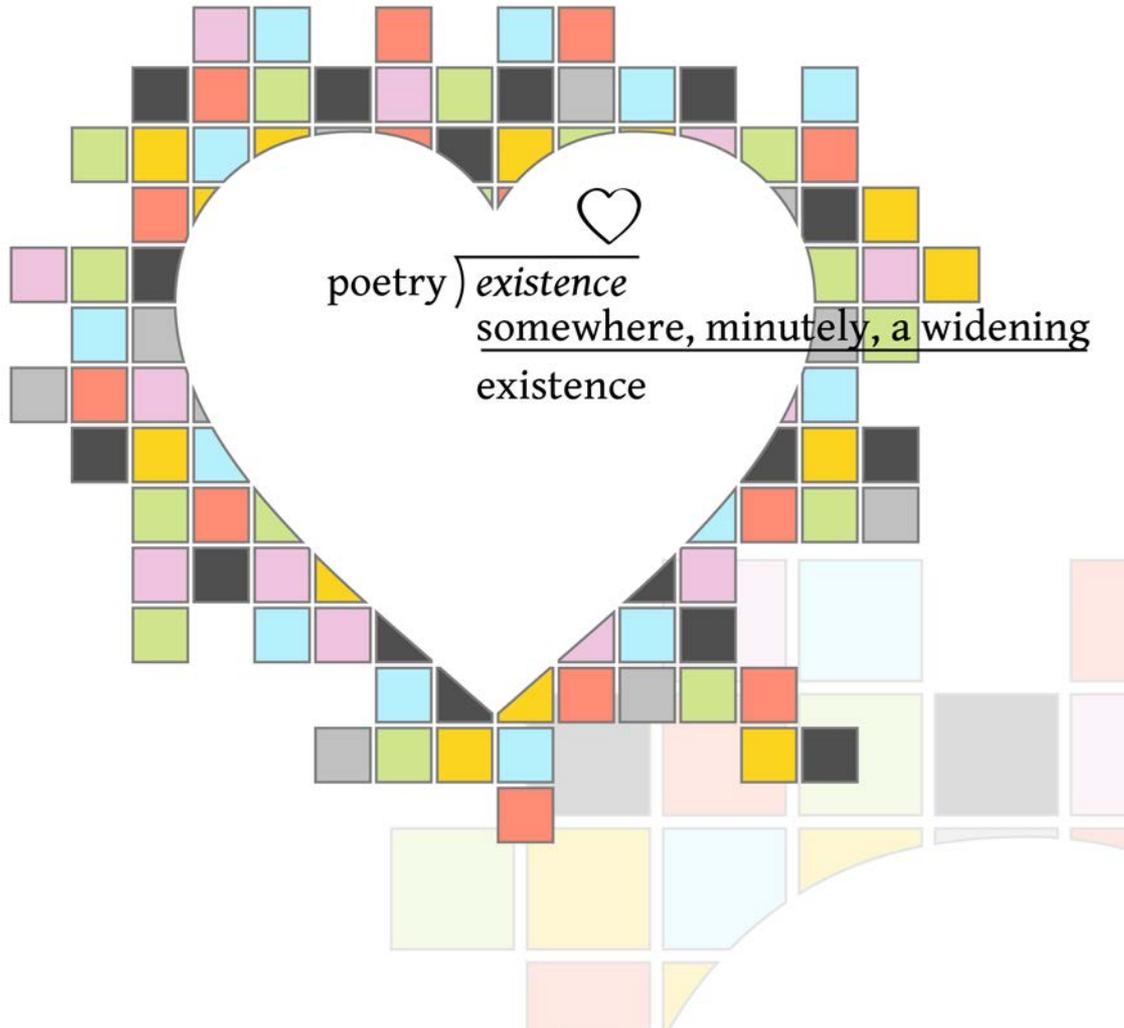
Not A Wake, Mike Keith(2010)

<http://www.cadaeic.net/notawake.htm>

The styles employed in the ten sections of the book are:

- 1 A free-verse poem.
- 2 Five short stories.
- 3 97 haiku on a wide variety of subjects.
- 4 Two intertwined poems which blend together as their narrators meet.
- 5 A surrealist poem in 14 stanzas.
- 6 A movie screenplay.
- 7 A dream about puzzles, containing two newspaper-quality crosswords with Pilish clues.
- 8 Three short stories.
- 9 Three poems and a stage play, each with an illustration that encodes some digits as well.
- 10 Ah, this one's a surprise!







Some websites to explore:

1. Joanne Growney – Mathematics in Poetry

https://www.maa.org/sites/default/files/images/upload_library/4/vol6/Growney/MathPoetry.html

2. 'Alphabet' Inger Christensen

1

apricot trees exist, apricot trees exist

2

bracken exists; and blackberries, blackberries;
bromine exists; and hydrogen, hydrogen

3

cicadas exist; chicory, chromium,
citrus trees; cicadas exist;
cicadas, cedars, cypresses, the cerebellum

4

doves exist, dreamers, and dolls;
killers exist, and doves, and doves;
haze, dioxin, and days; days
exist, days and death; and poems
exist; poems, days, death

5

early fall exists; aftertaste, afterthought;
seclusion and angels exist;
widows and elk exist; every
detail exists; memory, memory's light;
afterglow exists; oaks, elms,
junipers, sameness, loneliness exist;
eider ducks, spiders, and vinegar
exist, and the future, the future

Alphabet is a systematic poem, in which each of the fourteen sections of the poem is tied to a letter of the alphabet and the number of lines found in each section is dictated by the Fibonacci sequence. The first section, "A", has one line. The last section, "N", has 600.)

Alphabet deals with themes of nuclear war and ecological devastation. As the poem progresses and each section lengthens, an increasing number of elements related to destruction, death, and ecological devastation are introduced.

More on metaphor and analogy

“How is mathematics like a language? How is a limit like a curfew? How is a variable like a stranger? How is developing a geometric proof like investigating a crime scene?”

Thomas E.J., Brunsting J.R. & Warrick P.L. (2012) *Styles and Strategies for Teaching Secondary School Mathematics: 21 Techniques for Differentiating Instruction and Assessment*: Hawker Brownlow, Australia

Metaphorical Expression, pp 95-91

Science does this all the time, by the way!

A Bee in a Cathedral

An example of metaphor in use in the classroom

- **The Wanted Poster**

This offers students an opportunity to personalise their understanding of the properties of quadrilaterals (and other polygons, 2-D or 3-D shapes and objects).

- **Quadrassic Park**

This provides a narrative understanding of the relationships of the family of quadrilaterals.



Graphs – Telling stories

MCTP Tell Me a Story

1. Primary and Middle School (Years 5-7)

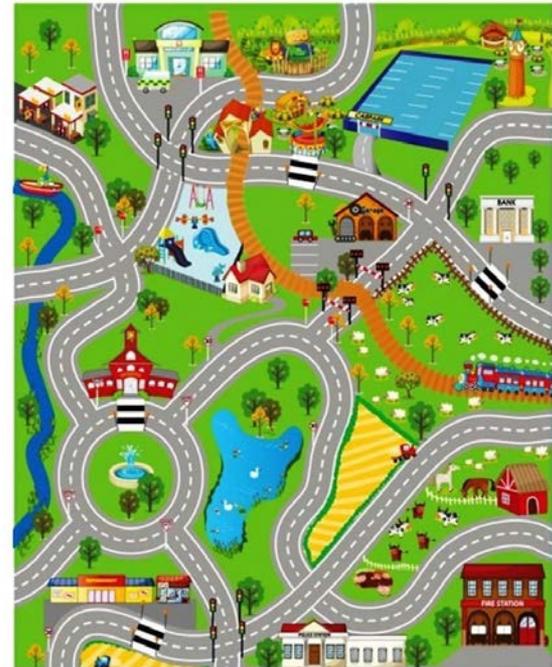
Creating and telling the story that the graph represents may be more powerful than simply answering questions about the information that the graph provides.

The Bath



2. **Secondary (Years 9-10)**

An exploration of distance –
time graphs.



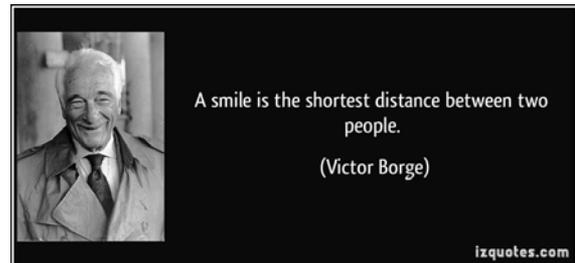
If it's good enough for MCTP...

Inflationary language (with thanks to Victor Borge)

Many years ago, Victor Borge created the game of inflationary language. Since prices keep going up, he reasoned, why shouldn't language go up too? In English, there are words that contain the sounds of numbers, such as "wonder" (one), "before" (four) and "decorate" (eight). If we inflate each sound by one number, we come up with a string of puns -- "twoder," "befive" and "decornine."

Here is a story based on Borge's idea. This tale invites you to read and hear inflationary language in all its inflated wonder -- oops, make that "twoder" and to remember the linguistically pyrotechnic genius of The Clown Prince of Denmark. (Richard Lederer)

https://www.youtube.com/watch?v=cOmdLmwZ_ww



JACK AND THE TWODERFUL BEANS (Richard Lederer)

Twice upon a time there lived a boy named Jack in the twoderful land of Califivenia. Two day Jack, a double-minded lad, decided three go fifth three seek his fivetune.

After making sure that Jack nine a sandwich and drank some Eight-Up, his mother elevenderly said, "Threedeloo, threedeloo. Try three be back by next Threesday." Then she cheered, "Three, five, seven, nine. Who do we apprecinine? Jack, Jack, yay!"

Jack set fifth and soon met a man wearing a four-piece suit and a threepee. Fifthrightly Jack asked the man, "I'm a Califivenian. Are you two three?"

"Cerelevenly," replied the man, offiving the high six. "Anytwo five elevennis?"

"Not threeday," answered Jack inelevently. "But can you help me three locnine my fivetune?"

"Sure," said the man. "Let me sell you these twoderful beans."

Jack's inthreeition told him that the man was a three-faced triple-crosser. Elevensely Jack shouted, "I'm not behind the nine ball. I'm a college gradunine, and I know what rights our fivefathers crenined in the Constithreetion. Now let's get down three baseven about these beans."

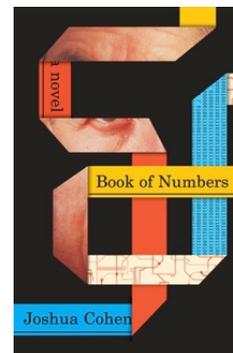
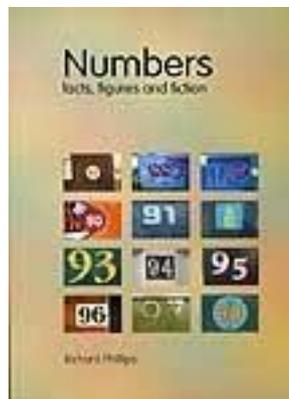
The man tripled over with laughter. "Now hold on a third," he responded. "There's no need three make such a three-do about these beans. If you twot, I'll give them three you."

Well, there's no need three elabornine on the rest of the tale. Jack oned in on the giant and two the battle for the golden eggs. His mother and he lived happily fivever after -- and so on, and so on, and so fifth.

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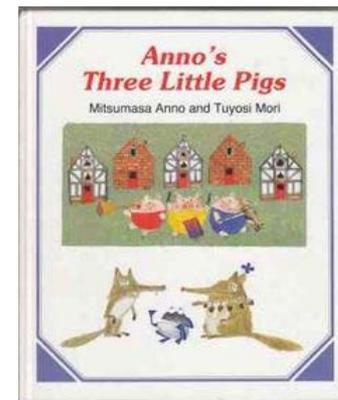
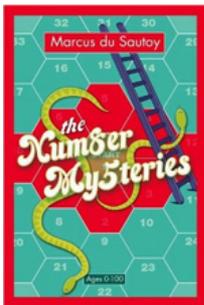
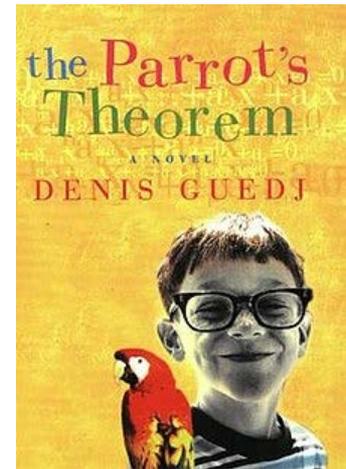
The challenge that we give our students?

1. Generate a list of 'number words'.
2. Decide on a theme that could be developed into a brief story.
3. The story is written 'normally' first.
4. Decide on a simple operation (e.g. 'plus two' or minus one' – or something more complex if this is in the context of learning about algebraic relationships – and illustrate (rewrite) the story in its new form.
5. The story is read to others in the class, who are then encouraged to 'crack the code' and explain the story.

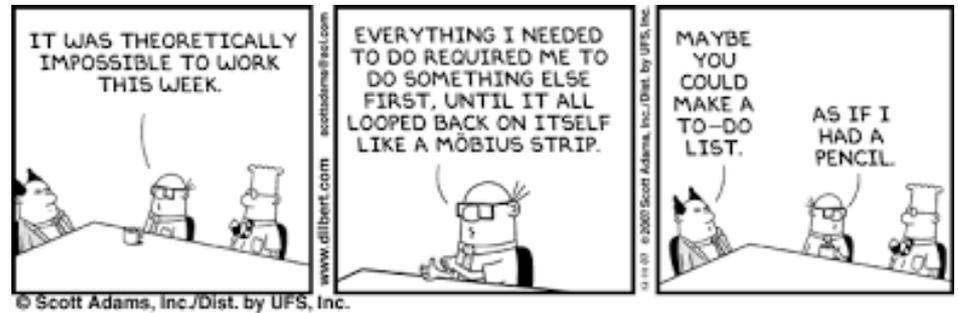
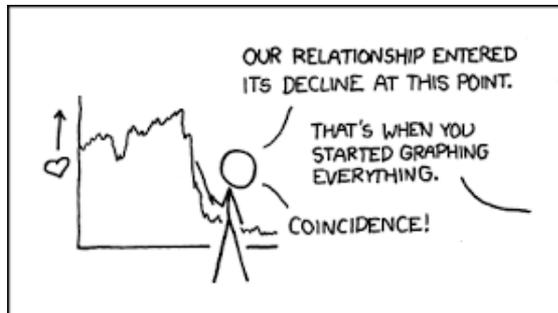
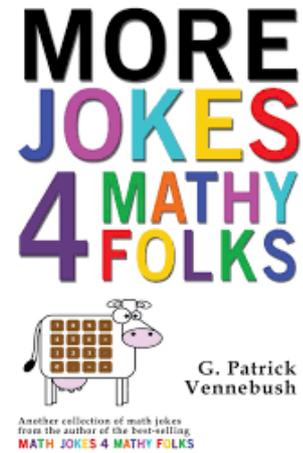
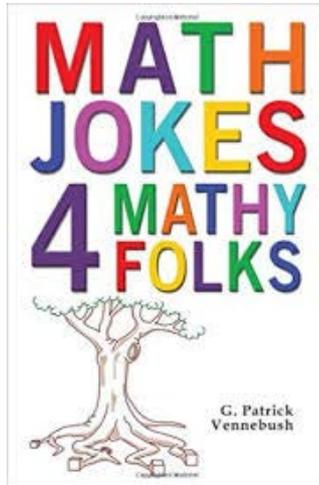


Some creative writing by others:

- Flatland (1884) - Edwin A. Abbott
- The Phantom Tollbooth (1961) - Norbert Juster
- The Dot and the Line (1963) – Norbert Juster
- The Parrot's Theorem (1998) – Dennis Guedj
- The Num8er My5teries (2010) - Marcus du Sautoy
- Traditional Tales *with a Mathematical Twist* – Vince Wright
- Children's books – Mitsumasa Anno
... and many more



... And the place of humour, puns and bad jokes!



It's All Bull

Big Chief Sitting Bull had three wives, as was the custom of the tribe. Falling Leaf was the youngest and most beautiful wife, and weighed just six stones. The middle wife was Running Nose, who weighed nine stones; but the oldest wife, Rolling Steam weighed a massive fifteen stones. One Christmas Sitting Bull bought each of his wives a new skin to sit on – a deer skin for Falling Leaf, a buffalo skin for Running Nose, and a rug made of hippopotamus skin for Rolling Steam. The Medicine Man of the tribe thereupon recorded in his diary the fact, now well-known, that the squaw on the hippopotamus was equal to the sum of the squaws on the other two hides.

50 Per Cent Proof *An Anthology of Mathematical Humour*
The Mathematical Association (1989)

And, in the spirit of both Literacy and Numeracy,

the last word goes to ...

*A Dozen, a Gross and a Score,
plus three times the square root of four,
divided by seven,
plus five times eleven,
equals nine squared and not a bit more.*

John Saxon

$$((12 + 144 + 20 + (3 \times \sqrt{4}) / 7) + (5 \times 11)) = 9^2 + 0$$