

When Stories March into the Maths Classroom

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Everyone knows the story of the thirsty crow, but this one is about a crow who liked to do things differently. So, when this 'thirsty crow' needed to drop stones in a pot to bring the level of water up for her to drink from it, she started chanting:

Line up here, then you Crow 1, go to my left.

Say 'Right' Crow 2 and go to my right.

Left and right, left and right.

Get a stone each, and drop it in, right!

In this way, this clever crow enlisted the help of other crows to quench her thirst. Depending on the creativity of the storyteller, the chant could be changed, sung, or made into a chorus, letting children have fun for a couple of minutes before the discussion moves to the mathematics involved.

Storytellers like to push the boundaries and tinker with established stories to stretch their appeal or make them more relevant to a specific audience, or to use stories for a purpose. Most preschool children do not like adults to change their stories. This modified crow story may be rejected by them early in its development. One child may shout out, 'The thirsty crow was alone!' Familiarity is one of the factors that makes a story dear to children. But, thankfully, children welcome change, sometimes they even *demand* it. At some point, children are ready to trade familiarity with some novelty. If the narrator invites children to become co-creators of a new story by making suggestions, change happens organically. What would have happened if the crow was too lazy? Do you think she could have done it any other way? Could she have drilled a hole in the pot with her beak? Perhaps a woodpecker did that, a child may answer.

Teaching maths through stories

Storytelling lends itself very well to building children's communication and comprehension skills. In the language class, the teacher can encourage the students to make up an entirely new story by using the opposites of all the adjectives in the story. In science class, students could try to see if the water level really comes up if they keep

dropping stones into a pail of water. And there is much that can be done in the mathematics class.

According to a Finnish study published in 2021 in the International Journal of Educational Research, 'Focused coding around how teachers employed 'storification' in both the physical environment of their classrooms and in their teaching practices revealed six categories of describing perceptions and experiences of storified pedagogy: alignment (integration) with teaching, providing a purpose for education, atmosphere (signalling), student (mis) behaviour, accommodating student abilities and sense of transportation.'

Addition, subtraction multiplication and division can all be taught using the crow story above. Let's say 30 stones were dropped into the pot. If each crow dropped one stone into the pot, how many crows do you think were there? If only 15 crows had come, how many stones would each crow have to drop? What if there were only 10 crows?

We can also use the story to teach concepts of form and structure, matter, solids and liquids, and volume. With abstract subjects like maths and science, most learning happens by rote and not by reason. Well-told stories, however, have a recall value that allows children to learn organically.

Stories help teachers to introduce a concept, make the learning more relatable and gain children's attention to easily introduce an abstract concept. How do you teach odd and even numbers? In the *Happy Maths* series, I made up a story about an old man who had an endearing habit that his grandson catches on, and he learns that odd and even numbers do have a role in real life, at least in his grandfather's life! In *One, Three, Five, HELP*, author Kuzhali Manickavel brings in beetles, lacewings, moths, spiders and other creatures to draw attention, not just to odd and even numbers, but also to addition. Any class in which this story, illustrated by Sonal Gupta Vaswani, is

included would have young children jumping with excitement!

Start, zoom, stop!

Stories have a way of growing without our knowledge. When a teacher decides to use storytelling as a tool, it is important to keep the end in mind as also the expected learning outcome. In *Who Got the Goat?* author Aparna Athreya brings in two lovable *asuras* who fight over who can drink more *neer-more* (spiced buttermilk). Here is a story meant to make fractions fun. The characters' names and the illustrations by Shreya Sen could easily turn the class into quite a laugh riot unless the teacher stops at the right place and moves to the maths!

Once, years ago, when I was teaching class V the magic of numbers, I got pulled into the fun, perhaps a little too far. I had encouraged the students to make paper planes, write coded messages on them and fly the planes inside the classroom. Whoever received a plane had to decode the message. Delighted with the enthusiasm of the students, we carried on, not noticing that the principal had opened the door and come in. How thrilled he must be to see such a lively mathematics class, I thought immodestly. He called me out of the class and gave me one of the coldest reprimands I have ever got.

Real stories

In my experience as a storyteller, I have been able to learn and question my own early misconceptions when I tried to explain a concept using the story format. Not all concepts can be told through a story. Not all stories lend themselves well to teaching maths. Many of the stories we grew up with, like fairy tales and *raja-rani* stories, have many politically-incorrect messages for today's times and are best avoided. Should we use folktales that seem quite violent, like the one where the wolf swallows

the little girl, and the woodcutter cuts open the wolf? Such stories are best avoided.

Real stories around us have a huge potential as pedagogical tools. You can tell them with conviction, and students can see the direct connection between their lessons and the real world. Here is a news report from the mountains of Meghalaya, home to the three main tribes *Khasi*, *Garo* and *Jaintia*. Unlike most parts of India and the world, their way of life and traditions are quite different. For example, girls in this region take on their mother's family name as their surname; they inherit land from their mothers, with the largest piece of it going to the youngest daughter; they inherit the knowledge of seeds; and they climb up and down many steep, slippery steps —sometimes as many as 2,500 — between their homes and farms.

This story, full of unusual and interesting facts, can be used in the maths class to teach distances, measurement (what do you think the height of each step in this story would be?) and the need for standard measurement as also:

- Volume: What would be the volume of one handful of seeds?
- 2D and 3D: If the seeds were laid out flat on the ground, what would be the area covered with a handful of seeds?
- Division and logic: If Bibiana Rane, mother of two daughters, has ten units of land, in how many ways can she distribute the entire land to her daughters such that the younger gets more units than the firstborn?

In summary

The amount of time, work and dedication that goes into making lesson plans leaves most teachers with very little time to read or look into other people's stories that are seemingly unrelated to work.

Given below is a list of articles and videos that teachers may find interesting and valuable in teaching maths.

<https://www.sciencedirect.com/science/article/pii/S0883035520318346?via%3Dihub>

<https://www.mathsthroughstories.org/about-us.html>

<https://storyweaver.org.in/stories/51422-one-three-five-help?mode=read>

<https://storyweaver.org.in/stories/92172-happy-maths-numbers>

<https://storyweaver.org.in/stories/356934-who-got-the-goat>

<https://www.yesmagazine.org/democracy/2016/01/08/in-photos-the-seed-saving-farmers-who-pass-down-land-to-their-daughters>

https://www.ted.com/talks/uma_adwani_the_hidden_messages_in_multiplication



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The questions asked during the course of storytelling play an important role in increasing awareness and empathy. If children are asked, what would they do if they were a character in the story, it helps and develops their thinking and problem-solving skills. For example, if the story is about dreams: What do you dream of? If the story is about fear: When are you scared of? What do you do if you are afraid? Questioning children's reactions gives them an opportunity to express their feelings and also to relate their own lives to their learning at school.

Padma BM, Learning through Stories, page 40