# Popular Stories in the Science Classroom

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*And thus, the crow quenched its thirst and flew away happily.*

*The hare realised its mistake and accepted defeat to the tortoise.*

*He went out running the streets, straight out of his bathtub, shouting, 'Eureka – Eureka'.*

These lines ring a bell for most of us as lines from stories we have heard or read as children. Most of us enjoy a good story but stories have a great pedagogical value too, especially in a science classroom. If we define science as efforts to understand the world around us by exploring and drawing relationships between different elements involved, then science teaching in a classroom should also pave the way for the student to practise and realise the value of exploration, recording, and analysing the observations made, and drawing relationships among the multiple components involved.

Encouraging children to participate in such a process while sustaining their interest can sometimes be a challenging task. A good story could come in handy in such times, not just to initiate a discussion, but also to encourage the students to participate in the process. Stories and storytelling could also be used as tools to strengthen existing learnings and for assessment. Along with this, asking the students to develop narrations around their observations or experiences, enriches their communication abilities. The language that stories use is often connected to the students more than the scientific vocabulary is. To illustrate this point, I would like to share two experiences of using stories while teaching. These have been tried out with participants of different age groups – primary and upper primary students, slightly tweaking the concepts as per their cognitive level.

**Some stories as pedagogy**

*The Thirsty Crow*

Objects exhibit different properties under different circumstances. Some objects float, some sink, and a few are suspended between the top and bottom when placed in water (or any other fluid, as a matter of fact). What causes these objects to behave in this way could be explained in terms of relative density. Understanding relative density requires familiarity with the concepts of volume, mass, and density. An effective pedagogy of such a concept should involve providing hands-on experience to the students wherein they observe the behaviour of different objects when placed in water and draw inferences. The launching pad for such an exploration should encourage students to participate in the learning process with as much enthusiasm as possible so that students can experience the process of inquiry. And this is where the story of the thirsty crow comes into play.

Most of us know this story, but to help you recall, the story goes like this: On a hot, sunny day, a crow in search of water spots a pot with a little water at the bottom. The crow begins to drop stones into it, one by one. The water level begins to rise. The crow keeps dropping the stones till the water reaches the top. The crow drinks the water and flies away happily. The story offers some interesting possibilities for initiating a discussion in the classroom.

It was tried out in a classroom; the discussion started with the following questions:

- Why did the crow pick up stones? Why did it not pick up any other object, such as sticks?
- How much water was in the pot initially? Would the water rise to the top if the initial water level is very low?
- Why did the water rise?

Most of the students wanted to try out what the crow had done. I arranged a few glasses, markers to mark the level of water, and a bucket of water. They ventured outside the classroom to pick objects of their choice. Most of them picked stones of various sizes. They repeated what the crow had done and observed the change in water levels when the stones were dropped into the water. While they were conducting the activity, I asked them to also vary the amount of water in the glass, and then

compare the observations. The whole classroom was filled with enthusiastic 'crows' trying all kinds of things – experimenting with different levels of water, different sizes of stones, and different kinds of objects too, some of which were floating. When I asked them to share their observations, the responses brought a variety of aspects into the discussion. I have listed some of the responses below:

- When the quantity of water was very little, it did not come to the top of the glass, despite dropping several stones.
- Pebbles were not uniform in size and shape. This caused issues when the pebbles were dropped into the glass.
- The irregular shape of the stones caused gaps when they toppled over one another causing water to flow into those gaps.
- Smaller pebbles collectively contributed to raising the level of water effectively. Even though larger pebbles raised the level of water, the gaps between them were large and, therefore, not as effective.
- Pebbles of uniform shape and size which align themselves to the shape of the container increase the level of water, whatever the initial quantity.
- Objects like styrofoam balls and sticks did not increase the level of water effectively. The rise in the water level was far less in comparison to the stones.

Leaving the discussion of the validity of the above responses for another time, these responses touched upon multiple factors, such as the shape of the pebbles and the container, the effect of the size of the objects on the change in the level of water, types of objects that contributed to the rise, and resulted in a vibrant discussion in the classroom. The participants seemed to be owning the learning process, thus, representing a participatory learning experience. The story set an effective launching pad to initiate the discussion and explore the floatation properties of objects in greater detail.

I tweaked the process while conducting the same activity with another group of participants. Rather than asking them to start with recreating the activity, I asked them to draw the story in simple pencil sketches to see how they represent the initial level of water in the pot and the subsequent changes in the level. I then asked them to start the activity with the same level of water as drawn by them in their sketches.

*The Hare and the Tortoise*

A phenomenon can be represented in multiple forms, for example, the motion of a vehicle could be depicted in terms of pictures, tabular columns having the position-time readings, and in terms of a graph. Each form of representation has its own advantages. Representing a phenomenon in a graph is a critical point for many participants, and I have used the story of the hare and the tortoise to further students' understanding of graphs. Representing this story on a position-time graph is an interesting exercise for it enables the participants to consolidate and validate their learnings.

In short, the story was: A hare and tortoise compete in a race. Initially, the hare speeds up, and being extremely confident of winning, stops to rest, eventually falling asleep. The tortoise on the other hand maintains its steady pace and reaches the finish line first.

While conducting the activity in the classroom, I asked the students to draw a simple position-time graph that would represent the story. I went around the classroom while they were drawing and noted down some of the most common plots. The responses from the participants were used to discuss and arrive at the corresponding representation of the story on a graph.

Once they completed the task, I asked them to focus on some of the key pointers from the story and ensure that the graph depicts it. For example:

- What does it mean to 'win' a race?
- How would you show that tortoise won the race?
- How would you depict the phase where the hare was sleeping?
- Would you prefer to draw two different graphs – one each for the tortoise and the hare?
- How would you show that the hare had a good start?

The class analysed their graphs based on their discussion of these points. Connecting each pointer to a concept in a graph was the crucial element. For instance, 'winning a race' on the graph would translate that the time value for the winner is less than the other, and the sleeping phase of the hare would be that portion where there is no change in position, despite the increment in time. The activity made much sense to the participants as they could

draw the correlation between the language of the story and the mathematical vocabulary of the textbook, which might not have been possible if the maths concept was discussed conventionally.

**Points to ponder**

One of the key challenges in using the story in a classroom is to create the students' interest in the story and sustain their enthusiasm while connecting the story with the chosen concept. While ensuring that as much space as possible is allowed for their responses, care should also be exercised to ensure that the focus is not diverted. Choosing the right story is another challenge that one encounters. The criteria for choosing the right story is not just limited to its connection to the concept, but also to guarantee that, while providing sufficient learning opportunities to inquire and investigate, the story should not encourage any bias, nor strengthen stereotypes. Sometimes, narrations around regular day-to-day experiences also help in achieving the desired effect.

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All in all, when we use art for storytelling, it leaves a strong imprint on the minds of children, especially learners who learn better with a representation of the oral story. Using art not only provides a huge scope for possibilities but also makes space for building unconventional logic to support the ideas. Since art is a representation of a culture, children learn about pluralism and apply their own cultural interpretations to the artwork.

*Abhilasha Awasthi, Telling Stories Through Art, page 12*