The Hindu Coimbatore 16-Apr-07

trend

Origami? It's math, silly!

EDUCATION Ever knew numbers could come alive through paper? Or that junk could explain air pressure? **W. SREELALITHA** discovers

It was just an apple that taught Newton the laws of gravity. And, our grandparents learnt counting through coins.

Somewhere along the way, the system became so complicated that science and mathematics ended up being dreaded by most students.

Now, a few people are trying to bring the zing back into teaching these subjects — as is learnt through workshops conducted for teachers at the Isha Home School near the city.

In all shapes

Made of paper, the stingray, notorious for Steve Irwin's death, sits stock-still on one of his worktables. Look around, and this becomes the least interesting object. You find cubes, cuboids, cylinders, cones and innumerable other hard-to-define shapes in various colours, but, not a single glue stick or a pair of scissors in sight! The workshop 'Mathematics through origami' is in progress.

Says Mumbai-based Ravindra Keskar, who conducts the workshop: "Children are haunted by a 'ghost' called Mathematics."

Teaching math through origami helps children understand the concepts — for instance, they realise why the volume of a cylinder is calculated the way it is.

This makes the subject interesting and easy, says Keskar who conducts nation-wide origami awareness workshops under the Central Government's fellowship.

Pointing out that math is relevant in every field, he cautions: "Being unaware of mathematics is tantamount to wastage of resources."

During his session, Keskar — part of Origami Mitra, a group of origami enthusiasts — goes about breaking a few popular beliefs.

For instance, he says that the volume of a square or a rectangular open container differs with varying height and width. The wisdom lies in using a specific product to obtain optimum volume. Now you know why water tanks are square, sweet boxes wide and tetra packs long!

And, origami works beyond just math. It makes everything from computer programmes and writing an algorithm to organic chemistry models and DNA helix delightfully simple. What more, it induces creativity and enhances the flexibility of fingers.

But, do teachers today really have the time to teach math through origami? "Unlike what one thinks, one will save time and resources this way," says this visiting professor of Electronics at St. Xavier's Institute of Technology, Mumbai, adding: "This is a one-time investment."

Says Maa Parini, who teaches math: "It is fun. Even the most complicated equation gets into a tiny piece of paper."

Even for language

Sudha Sathya, a language teacher says: "The learning becomes three dimensional — they know the concept, make a model and produce it on a graph. Action models such as elephants and butterflies can be used in storytelling."

Keskar sums up his efforts best when he says: "There is so much in Mathematics. And the whole idea is to make it sensuous."

Not just math. Even science, that many find daunting, can be made infinitely more interesting, using things as insignificant as junk.

As teachers find out at Pune-based Ashok Rupner's workshop.

He points to a small motor — a copper coil spins swiftly over a magnet.

The coil is placed between safety pins on a battery wound by a piece of cycle tube. Now, that is science through junk, all right! Rupner next shows how to give a balloon a shot. Balloon and injection? Yes. A balloon blown to half its maximum can be injected on the corners. Inference — it does not burst if pricked in an area with low tension.

Many a lesson

A lot many lessons on angles are taught using matchsticks; waves, frequency, wavelength and crest, and pitch and sound with straws; laws of momentum using marbles; air pressure through a PVC pipe and a paper cone; and centre of gravity out of nails — simple yet captivating.

"These experiments are very simple and can be done by anyone. And, 60 per cent of them don't need a lab setting."

He demonstrates how a pencil partly levitates — using just a couple of magnets, foam rubber and a tiny piece of a CD.

"Eighty two percent of what we learn is through our eyes, and that's why such experiments are vital," says Rupner, from Inter-University Centre for Astronomy and Astrophysics.

PAPER POWER There's lots to learn the fun way PHOTOS: S. SIVA SARAVANAN

Number crunching

"I must thank my Math teacher. But for the nightmare the subject gave me, I would not have explored origami," says Ravindra Keskar. Many years ago, while working with children affected in the Bhopal gas tragedy, it struck him they needed much more than just "the biscuits and milk" the Government provided them. What they required was inner stability and creative activity — an outlet for pent up agony. Shortly, Keskar began teaching mathematics through origami. Children who absolutely dreaded the subject, in fact, sat for hours together with him glued to the concepts, he recalls.