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This Indian makes science fun - for rich and poor

Features



By Michael Gonsalves

From Pune to Pakistan, an Indian science communicator is creating ripples of interest across hundreds of schools as he unravels the enigmas of scientific principles of centrifugal force, levitation trains and more through everyday tools like pencils and newspapers.

And it costs virtually nothing to either Dr. Arvind Gupta -- who is based in the western Indian city of Pune but travels all over the world making the learning of science fun through simple toys and explaining the fundamentals of science -- or the children.

"Science principles are best understood if children can see them in a toy which they can play with," says Gupta, who is coordinator of Children's Science Centre of the Inter-University Centre for Astronomy and Astrophysics, a high tech centralised research facility for scientists of all Indian universities.

His Children's Science Centre, spread over 500 sq ft and staffed by three immensely committed full- time science educationists, is a beehive of activity as it plays host to children from 400 schools from Pune city and nearby districts, including government-run schools with poorer children.

"School kids can do great science with little money and resources. They have an innate ability to see patterns in little things around them and they love making action toys that spin, fly, whistle, jump, and hop," says the 51-year-old author of 12 books who has presented 75 films on science activities on national TV.

"After all, the great pioneers of science did their work with simple equipment and the student's mind is the most precious piece of equipment involved which needs to be stimulated and given a direction."

Gupta, an electronics engineer from the elite Indian Institute of Technology (IIT) in the Uttar Pradesh city of Kanpur and winner of several awards for popularising science, gives a dekko into some of the things he does.

Origami-paper folding is a wonderful way to learn practical geometry and film-roll cans, mineral water bottles, rubber slippers, and crown caps make lovely action toys.

"For the last 25 years, I have been teaching students to make toys from simple materials - old newspapers, slippers, matchboxes, broomsticks, ball pen refills, film-cans, old cycle tubes.

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"The 'cricket cap' made from an old newspaper is a favourite with children. In the process of paper folding children learn some aspects of practical geometry," says the master toymaker and a UNESCO consultant on science teaching, who has been invited to and visited the US, Britain, Sweden, Japan, France, Finland and Pakistan.

Then there is the 'flexagon', which Gupta describes as a unique 3-D construct made from an old photocopy paper which rotates endlessly that can be used to depict food chains and life cycles.

"The Sudarshan Chakra (Hindu god Vishnu's mythical disc) made from two broom sticks and a piece of rubber slipper spins on the index finger the same way as planets circle the sun," says Gupta, whose book "Matchstick Models and Other Science Experiments" (1985), has been translated into 12 Indian languages and sold a million copies.

There is more.

The levitating pencil toy, for example, gives students a glimpse of the actual working of the magnetic levitation trains, which travel at 400 km an hour in countries like Japan and France.

Gupta is also a master story teller to popularise science. His books are a collection of science activity stories so that as the story is narrated, toys are also made to illustrate a scientific principle.

Talking about his classes that have also become the rage in neighbouring Pakistan where he has held training sessions for hundreds of teachers and students across several cities, Gupta says: "The children bring old newspapers, used photocopy papers, scissors, scale, glue, old slippers and other assorted things with them.

"In four hours they make 10-12 models - newspaper caps, colour mixer, rotating hexa-flexagons, flapping birds, a spinning toy made from two broomsticks and a piece of used slipper to demonstrate the principle of centrifugal force..."

The Indian doctor has urged the introduction of India-Pakistan exchange programmes for teachers and for increased people-to-people contact in all sectors between the two uneasy neighbours.

Gupta's centre has also been working with NGOs in slum and rural areas to popularise science. "These students are simply stunned and amazed to see the possibilities of doing science with simple things and we get the loudest claps from them.

"Learning is fun but our schools curriculum has become unfortunately a drag on children," he says in a matter-of-fact tone.

The money for the building came from popular author Pu La Deshpande's widow Sunita, who donated Rs.3.5 million (about \$78,000) from the sale of their flat. And the writer's vision for a free and open space where young children can simply play and give vent to their imagination and have fun exploring the joys of science became a reality.

The centre launched in June 2004 runs on a shoestring budget of an annual grant of Rs.500,000 (\$11,000) given by a private trust. Besides, the government's Department of Science and Technology pitched in with Rs.200,000 (\$4,450) for books and equipment in the first year.

But the movement has caught on.

Last year an old man, who wanted to remain anonymous, donated Rs.1 million (\$22,000) and promised to pay another Rs.1 million.

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"Money does not run the centre, it is the passion of the staff that does. We need just Rs.500,000 to take care of our bodily needs," says Gupta philosophically.

And hundreds of children, rich and poor, are happy.

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