

HE HAS TOUCHED THE LIVES OF SEVERAL OF INDIA'S URBAN AND RURAL CHILDREN AND HIS ACTIVITIES HAVE ALWAYS HAD A LASTING IMPACT ON YOUNG MINDS. **ARVIND GUPTA**, TOYMAKER AND SCIENTIST EXTRAORDINAIRE, HAS TRANSFORMED THE **CHILDREN'S SCIENCE CENTRE OF THE INTER-UNIVERSITY CENTRE FOR ASTRONOMY AND ASTROPHYSICS (IUCAA)** INTO A MAGICAL KINGDOM OF SCIENCE.

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It's morning and the winding roads in the University are almost deserted. But one man's workplace isn't. It's chock-a-block full of many small things and interesting things.

He is dressed in a simple *khadi kurta* and pants. He has aged with grace. Greying hair in his beard remind me he is aging, but not his joyous spirit. When he talks about his work, he transforms into a 20-year-old young man. His enthusiasm is infectious. In an instant he draws you into his world of toys. He has turned the Children's Science Centre of The Inter-University Centre

for Astronomy and Astrophysics (IUCAA) into a Disney Land of science, if I may say so.

The saying by Albert Einstein is apt for the work this man has been doing for more than three decades now. The quote goes, 'Everything must be made as simple as possible. But not simpler.' Arvind Gupta, toymaker and scientist, who has popularised science, has made science simple and fun with all his toys made from trash.

In between demonstrations of the toys, he shares his life, his childhood, his work, and people he admires, and the thousands of toys he has made.

FROM TRASH to Toys



Arvind Gupta

He had a very happy childhood, says he. His family, which resided in Uttar Pradesh, was poor. Little Arvind enjoyed pottery and other such activities. And his mother, who had never been to a school, let him be. A rich relative of his gifted him a Meccano set once. This just kept him busier, playing on his own. He smirks, "Mine was a happy childhood, despite little money."

Later, young Gupta graduated in electronics from IIT, Kanpur in 1975. This institute opened up the world to him. This was where he learned a lot, he read

a lot. With the access he had there to the library, he finally had the opportunity to read a lot of books which he never had in his childhood. His peer group was bright too. He does not mince his words while praising the institute, where he spent five interesting years of his life.

He especially remembers and mentions a lecture by Anil Sadgopal at the institute in 1972. This sensitive person, who had started the NGO Kishore Bharati, touched Gupta's heart. He felt inspired by his work of activity-based science.

'70s was also the time when there were political movements taking place all across the world—by Jai Prakash Narayan in India, the feminist movement abroad, and so many others. The political slogan during this time was 'go to the people; love them'. So there were a lot of good people who wanted to do something with their lives. All this left a lasting impression on Gupta's young mind.

Soon, the world was to get bigger for him. He started working as a maintenance engineer with Tata Engineering and Locomotive Company (TELCO). But Anil Sadgopal had never gone out of his mind. In 1978, he took a year's study leave from his job and worked with Sadgopal's NGO Kishore Bharati. This was his first exposure to village life. This is where he made the first ever toy for kids, the Matchstick Meccano, a toy made out of cycle valve tubes and matchsticks. Children in the village were thus taught basic shapes like a triangle, a pentagon, and others. He shows me the toy, first in 2D, then as 3D shapes.

24-year-old Gupta soon got back to his job at TELCO. But one thing kept ringing in his head—that making toys was better than making trucks. But quitting a steady job like this was no smart decision, said his uncles. His mother was the only person who supported him and put faith in him. Thus, in 1980, after five years of working at a steady job, he quit. He quit to follow his heart, which reached out to the poor, to children who could be taught science in a simple manner, with the numerous toys he was to make for them.

He is thankful to all those people who have influenced him; all of whom were sensitive, had a world view, and wanted to do something in education. One such person was



Science models at his workplace

Photographs: Shrirang Godbole



Arvind Gupta's workplace, Children's Science Centre of IUCAA

the late Laurie Baker, a British-born Indian architect, who made humble dwellings for the poor in India. With him, one of the greatest mentors in Gupta's life, he had spent some five months.

His toys are, of course, a part of our discussion. So every now and then he shows me one. He shows me a pump made of cycle tubes, two plastic camera roll cases, and straw. Yes, a balloon can be inflated with this. Check his name out on YouTube; there are 4000 films and videos in 18 languages, of all such toys made by him.

Though toy-making comes across as his primary passion, in reality his deep interest lies in education. Toys facilitate his vision. His idea is clear. Children want to make things and play, and traditional India believes in learning best from the waste. So make toys from trash. From these toys, one can learn simple principles and topics of astronomy, biology, mathematics, and electricity and magnetism, and varied other sciences.

Gupta says, "Children learn best through play; all are born to play. Nothing should be forced on them. I make toys that they could play with and it is all science. We make use of simple materials; so each child can make a lot of toys. And I believe every person has the ability to understand science and appreciate science if it's put to them in a simple way." Now for example, instead of throwing away the tetrapacks of Frooti, or other such



Arvind Gupta with his toys

soft drinks, he makes toys out of them. He shows me a purse made out of a few such tetrapacks.

Gupta has conducted innumerable workshops at urban schools, schools in villages, NGOs, in the country, and abroad, in Sweden, South Africa, and many other places. He has conducted workshops for physically and mentally challenged children, for poor children, and many others. Every time he conducts a workshop, he puts forth only one small request—that he be allowed to demonstrate his work in front of an assembly of students, and not in separate classrooms.

From the motley group of toys at his workplace, he takes out a motor made of simple equipments—a battery, magnets, two safety pins, and a motor-rewinding wire; that is all. It works. The very same motors that are used in fans, mixers, and so many other devices you have at home, office, etc. The same device is here, taught in a plain fashion, making use of nothing fancy, and nothing expensive.

The simplicity of all these toys can be understood by the trash that goes into their making—to list a few, there are plastic bottles, tetrapacks, matchsticks, straw, cycle valve tubes, broomsticks, plastic plates, old CDs, and lots of other such junk items. There are 150 toys that make use of plastic bottles. And in total, he has made no less than 1000 such simple science models, all made out of trash.

You can do nothing but be amazed of all such wondrous toys. And yes, try making them with him... He has taught kids from urban schools to Zilla Parishad schools, and so many other schools in remote areas. And this is what he has observed, "Many children from villages come to this centre. They are often better at hand skills; they are freer with their hands. Well, Zilla Parishad school kids make these toys faster than the kids from urban schools."

And thankfully with the efforts of the government and other private companies and social organisations, computers have reached almost every other nook and corner of the country. They have rightly used this technology to their advantage. Gupta has his own website from which one could learn many things, right from making these toys, step by step from the photographs, the videos, and other information. There



Arvind Gupta showing science models to students



Toys at Arvind Gupta's workplace



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are 4000 books on varied subjects like science, mathematics and literature for children, and many others available free for download. They are trying to put up many more books in Indian languages.

Dissemination of knowledge is via diverse branches. You could just read about his website, www.arvindguptatoys.com. Apart from this, they distribute the DVD called *Learner's Library*, which again has all these photographs, videos and books for free. They have shared this DVD with more than 7000 schools across the country. The DVD is widely going from hand to hand in South Africa too.

He shows me yet another toy, the touching slate. This slate is such a fantastic piece of his work. It is made of Velcro pasted on a sheet. One could draw on this by making use of wool, which again is a wool-pen toy he has made. Do you want to know why he has named it the touching slate? It has a bigger purpose—the slate can be used to teach the blind; he can use the sensation of his touch to learn things that are drawn on the slate. Just feel the wool, the pictures that are drawn, a flower, a leaf, or anything else, on the slate.

On a lighter note, with a hearty laugh, Gupta says, "There is no dearth of junk in our society. So try and see possibilities in every such trash."

He has conducted workshops across many schools abroad. When asked about the stark differences between the education system there and here are, he explains, "The population is less there and resources so much. Even in rural schools, you are left absolutely stupefied with the kind of resources they have. There it is more of a hands-on science. Here, we have so little. Our schools are boring; they cannot engage students. So many poor students run away from schools. We don't understand that there is so much life outside a classroom."

He adds more about the ugly reality of our education system. After having worked with more than 1500 government schools in the country, he has realised we need inspired people to inspire these children. He says, "We did a science-activity programme for over 25 years. But because of some other interests of some political outfits, it was shut down." He criticises our education system simply by putting forth more such gloomy pictures. School libraries are mostly shut, laboratories are full of burettes and pipettes lying down in the shelves, coated with dust.

Let's keep such ugly facts aside for the time being, and instead see yet another toy—more interesting, more beautiful. He now shows me a balancing toy with a very countryside touch to it. A wooden slab has holes for nails to be inserted. And in one such hole in the centre is a nail, on which ten other nails are balanced. Yes, ten nails on a nail!

I still wonder how easy or difficult it is to learn science through such great toys. He clears my doubts, "We feel if children can play with something, it's less threatening to them. Through such toys, you intuitively grasp the phenomenon without being taught about it. They learn a great deal of science this way." Little wonder then that this man has won several awards for his work of popularising science.

In this 400 sq ft workplace of his, he humbly mentions two other important names, which changed the course of his life and of his work, Jayant Narlikar and the late PL Deshpande. The Children's Science Centre was Narlikar's dream, his idea.

I just glanced around the room one last time, before I was to take his leave. He got back to work amidst the colourful, simple world of toys, where he finds his peace of mind, and his way to touch the lives of hundreds and thousands of kids. ◀