

The man who makes toys from trash

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An Indian toy inventor who shares his love of science with children, Arvind Gupta thinks our waste can truly become playful if we're open-minded enough to embrace our creativity.

He discusses what motivates him to blend science with toy-making.

A [house](#) made from paper. A [hovercraft](#) made from old CDs, glue, balloons and rubber bands. A [cobra](#) made from Popsicle sticks. These are some of the unique toys created by [Arvind Gupta](#), who lives in Pune, India, and works in a Children's Science Centre located in the Pune University.

He is best known for creating educational toys using simple items found around the house...or dumpster. That old film roll box? Gupta uses it to make a toy trumpet. Empty pencil box? Gupta can [fashion](#) a simple periscope with that piece of cardboard, cello-tape and two mirror segments.

Part of Gupta's love of science is to share his knowledge with others. He has [filmed](#) hundreds of instructional videos to show how to make certain toys and devices, most in English but many in Hindi, Tamil and Kannada. Teaching kids about science has always been a priority for the graduate of the Indian Institute of Technology.

Gupta recently gained global game when [TED Talks](#) aired his short talk on creating toys from trash, in order to give children in Third World countries both fun playthings and an introduction to science. The video was a tease and Digital Journal wanted to learn more about what motivates Gupta to take science out of the classroom and into the hands of young children.

Digital Journal: What inspired you to create these toys?

Arvind Gupta: As a fresh engineer I worked in a truck plant for two years. But after two years I realized that I was not born to make trucks. So I took a year off to work as a volunteer in a grassroots village science programme. The attempt was to revitalize the learning of science. To make science interesting for village kids who had no labs and learnt science by rote. We explored possibilities of designing simple fun experiments using easily



Courtesy Arvind Gupta
Arvind Gupta, an Indian toy inventor, at work

available local, low-cost stuff like matchboxes, coins, broom sticks, newspapers, cycle tubes, old electric bulbs, rubber slippers etc. The children loved them.

During my first month as part of this village internship in 1978 I stumbled across cycle valve tube – a small piece of which is used to pump in air in a bicycle. This black thin tube is available locally. Using bits of tube as “joints” and matchstick I designed the Matchstick Mecanno – with which children could make many 2-D and 3-D shapes and explore fairly advanced concepts in geometry. This really hooked me. I felt this was much better than making trucks.

Digital Journal: Do you believe you have a skill to hand make these toys that others don't have? Or can anyone do what you do?

Gupta: I have conducted thousands of workshops with children and teachers. One thing I can say with some certainty. All children love toys so they are motivated to make them. Most of them pick up the skill quite quickly. Others learn by seeing their friends.

Take the instance of the “cricket” [cap](#). It is folded from half a newspaper. It is a “cool” cap which every child wants to wear. If one child makes it then there is a peer pressure on the others. No child wants to be left behind. So in the end everyone makes one.

Children, unlike adults, are not afraid of failure and so they learn these rudimentary skills fast.

Digital Journal: How many toys and films have you made altogether?

Gupta: We have documented over 700 different models of Toys from Trash on our [website](#). There are clear photographs and crisp instructions to make them. We have also made 275 short films (1-minute duration) on how to make these toys. These films show the whole process of making and playing with the toy.

These short films have been dubbed in 13 languages (most of them Indian). So currently we have over 1100 films on YouTube with over 8000 viewers every day.

We seek friends / partners to help us dub these films in other world languages and to upload them on YouTube for free public viewing. When children see a film in their local language it makes a lot more sense to them.

Digital Journal: What do you think is important about your work? What do you want to teach people?

Gupta: Most of our village schools have no science laboratories. All science is learnt by rote – by mugging up definitions and formulae and spitting them out in the exams. Science

laboratories are supposed to be expensive – with lots of costly equipment – burettes and pipettes which often lie unused locked in cupboards with a grime of dust. This is dead science.

We believe that creative, vibrant science can be done with simple things and should be accessible to the poorest kids. So, we use the humblest materials, a lot of it is throwaway junk – old newspapers, plastic bottles, tetrapaks, cycle tubes, old pens, refills, brooms and rubber slippers etc. There's a strong element of reuse in recycling in making these science models.

We sincerely believe that children everywhere can do wonderful science with little expense. The message is DO MORE WITH LESS.

Digital Journal: Do you believe those in Third World countries can benefit from your videos? If so, how so?

Gupta: The resource guzzling models of the developed countries are inappropriate for the third world. We have to look at our own resources critically and build on our own strengths. Our simple science models should in theory help children and teachers in poor countries but unfortunately most of the letters and feedback we receive is from the rich countries.

Many poor countries perhaps, are too preoccupied with problems of livelihood and insecurity and can spare little time and resources for education. They seem to have also internalized “colonialism” very deeply. So, they don't accept things until it comes from the West.

In this unjust world there is big digital divide. It will take several years for Internet and broadband connections to reach far flung remote Indian villages. So we have collated a DVD titled Learner's Library. It contains 1000 amazing books on Education, Peace, Environment, Science, Mathematics and great Children's Books plus 150 short films on Toys from Trash plus 7000 photographs with instructions. All this amazing stuff packed into a single DVD. We have shared this DVD with over 3000 schools for free. We will be delighted to share this DVD with teachers in different parts of the world.



Arvind Gupta teaching Indian children about science

Digital Journal: What's the next year look like for Arvind Gupta? What new projects are you working on?

Gupta: I have been working on a picture cartoon book titled The Story of Solar Energy and will finish it in the next few months. India has so much sunlight and we must use this non-polluting source of energy to the hilt. Also we have at least 100 simple toys which need an illustrator so that we can put them in two small booklets.

Apart from this every week we will host two free science workshops for school children. In each workshop 50 children from a particular school, apart from seeing some amazing science demonstrations will also make 10 simple toys with their own hands. They take back what they make

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