

# Worst garbage becomes science

October 27th, 2011 at 00:01, Updated: 30 October 2011 at 09:34

TOY MAKER Indian engineer Arvind Gupta wants to show that science and play go together. Using the usual rubbish, he is the most ingenious designs that teach children how physics works, while they have fun.



## PROFILE

Arvind Gupta, Indian toy maker and scientist.

Born: 1952 in Kanpur, India

Education: M.Sc., Indian Institute of Technology Kanpur

Awards for the popularization of science: Indian Academy of Sciences, Indira Gandhi Prize 2008, Third World Academy of Science regional price 2010th

Make: Works on Children's Science Center at the Inter-University Centre for Astronomy and Astrophysics (IUCAA) in Pune, India.

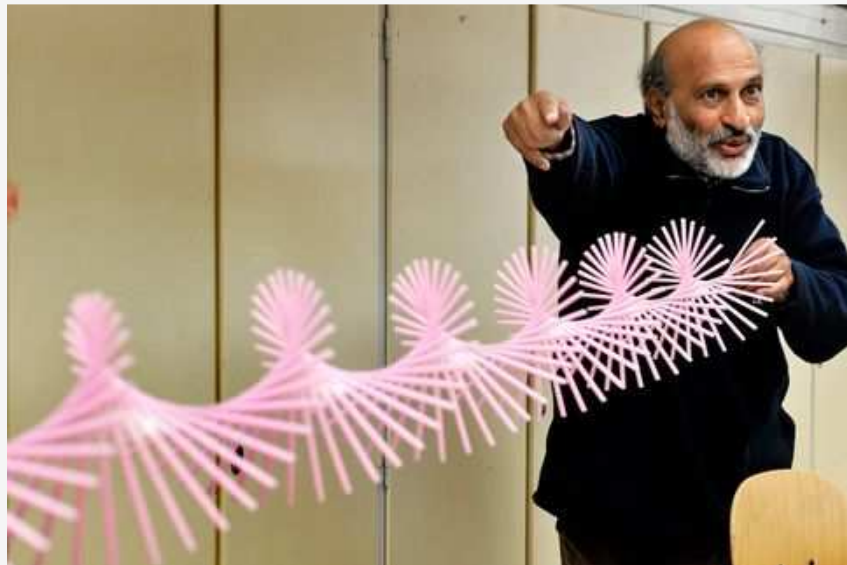


### Play online

On Arvind Gupta's website appears short YouTube videos of how to work. Learn to make "a pump from the dump," a pump from an old toothpaste tube or other scientific "junk toys" with the help of the descriptions. For example, there are instructions for astronomy toys Foucault pendulum, or moon phase, a folding pentagon or a magnetic flashlight:

arvindguptatoys.com

See also lecture at the TED talks.



- Look here! Arvind Gupta said enthusiastically as he quickly showed models made from thin wooden sticks with flexible rubber corners (cycle valve tube)

The Indian scientist and toy maker Arvind Gupta was visiting Sweden earlier this year, invited by the Royal Art University architecture school, Mejan Arc. But some teachers in French schools saw vigilant enough to allow him to meet with school children as well.

Svenska Dagbladet meets Arvind Gupta along with a high school in the French school, at the top of the house on Döbelnsgatan in Stockholm.

- Putting together an ordinary small bicycle tire and a few small sticks so you can create a triangle or a rectangle, a rhombus, or check out now, a part of a house!

Regular garbage will be both toys and math aids in Arvind Gupta's hands. His taped together straws show how the DNA helix looks like a round wooden board tells what happens to colors when mixed. He also explains why triangles make stable trusses.

Back home in India working Arvind Gupta for a science center in the city of Pune, southeast of Mumbai. He is passionate about making educational toys of debris, especially with the poorest children in Indian villages. Therefore, almost all the material he uses things that can be found even in the smallest hole in rural India: pieces of bike tubing, old newspapers, beer cans and juice containers.

The Swedish students, who go next year in high school, are polite. Arvind shows them how to make toys from trash. They are doing their best to get to the nifty things the junk he has with him. But it is only when some seventh graders will be on spontaneous visits to picture the room

as you sense the power of the combination of play and science.

- Fans cool, exclaims a guy and blow off a straw chopper.

- What a do I do with my dad when I get home, says another.

In a few minutes, they are completely in Arvind world.

- Play is "serious business", says Arvind Gupta. Students may not always understand the principle behind a design, but they have done it with my hands so have some sort of knowledge penetrated into their heads. Perhaps it can be put to use when they build houses in the future or it is just fun for the moment. It is so good.

The first contact with science should be fun. If you can make a link to the actual everyday life then it will be exciting, says Arvind and shows off a pump that he had made from an old toothpaste tube. It has been named "A pump from a dump," from a garbage dump.

- We live in a junk society. It is good if we can take advantage of it.

Arvind Gupta calls himself "a product of the 1970's." He is the engineer that the green wave-wise came from a well-paid job in the city to the countryside to do something worthwhile. One message called him, he says: "Go out to the people, live with them, loving them and building on what they have and what they can."

- I was inspired by student revolts. You know, 1968 in Paris, Vietnam movement, feminist movement, protests against environmental destruction. All that deeply influenced me. In India, there were also many strong political movements. The whole society was moving then. Highly educated people left their jobs; scientists quit because they did not want to create atomic bombs but rather to make life better for people, says Arvind Gupta over a vegetarian lunch in the French school's canteen.

He himself had received a fine job at a car plant directly after graduating from one of India's elite schools for engineers. He stayed there for two years. Then he felt that it was not his calling to develop better and better trucks.

- Looking back, it was good to work near the assembly line in a factory, to be a part of mass production and feel the alienation.

In engineering education, he had also been trained in philosophy, sociology and history of science in addition to engineering studies.

- That was fortunately good training out in the 1970s. It would not create one-dimensional people, says Arvind Gupta with a wink.

Many of his classmates from the university went to the U.S. and had a career.

- After ten years, the directors or successful in other ways all of us. But there were so many problems to solve in India. I wanted to stay.

Arvind Gupta's mother was unschooled and although she was very proud of his son's academic success, she never protested when he resigned from his permanent job at the car plant. On the contrary, she was proud of his social commitment.

Arvind Gupta began gently to take a leave of absence for a year to work in a village school. It was the 1978. When he moved into the village, he noticed all the pieces of bike tubing and thought "hmm, this might be useful".

- I've always been fascinated by different kinds of materials. It is still lying around somewhere. I started making models. In the end, I made a book of simple toy models.

It was the 1985. Since then he has published many books with toy models, made by the simplest possible material in different languages. In addition, an online site with short films in which he shows how to make different things.

Arvind Gupta has received several prizes and it happens that he gets invited to scientific

conferences to show how to go about conveying scientific knowledge in a simple manner.

- Every day thousands of children watching our films. All are welcome to download them to their own computers, translate them and distribute them in their own country.

A few years back Arvind was lured by a friend to participate in shaping a science center for children in an Astronomy and Astrophysics Center, University of Pune.

- Today, I get three or four invitations from schools every day. We want to reach many. I give lessons at 1.5 hours. Schools are often stupid they send boys because they do not believe that girls are interested in science. So stupid! In addition, they send only the academically best boys who sometimes are very poor at using their hands.

After Arvind visited it happens that the closely supervised, the students break up the pens to build with them. Then Arvind reached his goal. A certain amount of civil disobedience is necessary if there is any development. He should encourage them to break the rules, only the protests will lead to something creative.

