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### **Straws, sticks and science**

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The magic of science: Students at the workshop. Photo:M.Balaji

THE HINDU

*Can a toy made from trash teach centrifugal force? That's what R.V. Prakash did as he popularised Arvind Gupta's 'science toys' made from everyday objects*

R.V. Prakash was camping in an old church in Mizoram. He was there to document innovations from around the region as a volunteer of the National Innovation Foundation's Shodh Yatra. One evening, Prakash saw some kids in the area. He was reminded of Arvind Gupta, well-known for his 'science toys' made from everyday objects. There was no electricity, but Prakash had with him some straws, rubber tubes and plastic boxes and decided to teach the kids to make some toys. "With candles around us, I taught them to make toys such as the straw spinner and flexagon."

#### **An experiece for life**

It was an experience he would never forget. The kids, most of them with very less opportunities and exposure, were so enthused that Prakash wanted to take Arvind's methods to as many children as possible.

Prakash's tryst with science toys started a year ago, when he chanced upon a video on Arvind online. He couldn't resist experimenting with some of the toys himself. Prakash later wrote to him, expressing willingness to translate some of his videos to Tamil. Arvind sent him the scripts. "His website ([www.arvindguptatoys.com](http://www.arvindguptatoys.com)) consists of open-source material that can be accessed by anyone," says Prakash.

Prakash believes in teaching things in a simple way. He recalls scouring Chennai to learn electronics hands-on as a young graduate. When unsuccessful, he taught himself with help from the Internet. Today, through his Chennai-based company, 'Simple Labs', Prakash provides hands-on training in electronics to those interested. And, ever since he came across Arvind, he has been doing all he can to popularise his methods. "Everything is available online. Anybody can take the initiative to teach children," he says.

#### **Toys from trash**

Prakash was in Uthukuli to conduct a workshop on toys from trash. He was invited there by the Cuckoo Movement for Children, a group of friends who work to create a spark in the minds of rural children by establishing libraries and involving them in various group and Nature-related activities.

It all starts with a plastic straw. After a cut here and a bend there, Prakash uses it to teach centrifugal force. In under

a minute, the boys gathered under a tree seem to get it.

“What can a straw do?” asks Prakash. “Can it pump water from bottom to top? It can. Look.” The boys watch closely as Prakash bends the straw to form a triangle and makes slits at two corners. He passes a stick through the base of the triangle and tapes it to the opposite edge. Prakash then immerses it into a mug of water. He holds the stick and twirls it — water gushes from the slits like a fountain!

“When water spins, a certain *shakthi* is formed. Because of this, air at the centre of the twirl pushes water out through the cuts,” he explains.

The boys are quick to make their own pumps. “*Varudhu da!*” yell Udhaya Kumar and Abu Udkeer when water sprays out of their centrifugal pump. There is laughter and excitement — if only classrooms were always like this!

Prakash then teaches them to make a flexagon with a square piece of paper. It is a little difficult to make, but is fun, nevertheless. As we struggle to make ours, student Kadhira Prakash has finished his and is helping his friends with theirs. “It’s easy,” he says as he folds and unfolds his paper to show us how it’s done. “*Purinjadha?*” We nod, still unsure. Next up is a siphon. With nothing more than a bendable straw and a plastic cup, Prakash explains how the mechanism is used to drain water into agricultural fields. “The same principle is used in dams where water is stored and from where it flows to low-lying areas.” A water pump using a piece of rubber tube and small plastic boxes is next.

Prakash conducts a similar workshop at the Government Higher Secondary School for Girls, Uthukuli. But for Prakash and those at Cuckoo, it is kids like Logeswaran who make the day. The 13-year-old leaves the workshop with his version of the centrifugal pump — he has attached a paper fan to the straw. It flutters and rotates when it catches the wind. “You know, this kind of a technique is used to drive hand pumps in salt pans in Gujarat,” says Prakash. “Just imagine, the kid just did it on his own.”

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