

Toying with Trash, Science and Art

By Arvind Gupta

Making toys from everyday materials is a fantastic experience for children - much more creative and enjoyable than ready-made kits can ever be.

As a child, I used to go the Mahashivaratri Mela held near a water tank in my small town. Here, I would buy clay camel carts, coal engines and other wheel toys all for a few coins. With spiraling costs, I often wondered how the potters could even afford to bake those toys. One potter told me, "We just scrape a living making clay pots and pitchers. These toys are small so we just stow them between pots. We discount their fuel costs. Children have to play and we have to make these toys." This ethic enabled children like me, with little money, to buy toys.

India had a strong tradition of crafts people making folk toys. The factory system of mass production destroyed this tradition. Some of these toys can still be bought in museum bazaars of the

Dilli Haat or Dastkar. These vernacular, local or folk toys embodied a societal code. This code stood traditional "economics" on its head – the cheaper the thing, the greater its value; and the value increased as more and more people used it. A whole civilization built around these lines enabled the poorest children to play with toys.

All things mattered, even the small things that we would throw away. Even discarded things had a life of their own, and were capable of providing thrilling and deeply touching experiences. This was the code imprinted deep in traditional toys. Since everything mattered, nothing was destroyed, only reincarnated. So throw away wire, pieces of cloth, wrapping paper, card covers of books all transformed into

Science is not hardware, burettes and pipettes. It is a way of critically looking at the world in search of new patterns.

beautiful toys. Every object had many lives. In this scheme, the value of an item was not judged by its market value but what it was capable of doing in its many lives. Old saris were stitched into petticoats and children's clothes, the remaining scraps were transformed into cloth dolls to play with.

This austerity of reduce, reuse, recycle, is best symbolized in this Buddhist tale:

A monk approached the Buddha for a new woolen shawl (angarkha)

"What happened to your old shawl?" asked Buddha.

"It got worn out so I used it as a bed sheet," replied the monk.

"What happened to your old bed sheet?" Buddha enquired.

"The old bed sheet was worn out too. So, I cut it up and made it into a pillow cover," replied the monk.

"But what happened to your old pillow cover?" asked Buddha.

"My head had rubbed on it a million times and made a big hole in the pillow cover. So I used it as a foot mat," replied the monk.

The Buddha was not entirely satisfied.



Probing further he asked, "But what did you do with your old foot mat?"

The monk replied with folded hands, "Master the old foot mat was frayed with repeated use. Its warp and weft had become loose. So I collected the fibers and braided them in a wick. Later I burned the cotton wick in the oil lamp."

The Buddha smiled after listening to the monk and gave him a new shawl.

Today's rampant consumerism is producing mountains of junk and trash. This impending calamity was graphically captured by Annie Leonard in a must-see 20-minute film 'Story of Stuff' (freely downloadable from www.storyofstuff.com). This film created new benchmarks of activism on the web with over 9 million viewers! We dubbed this film into Hindi and Marathi after obtaining permission. The film stated that recycling helped but it was not enough. Many of the technological solutions being peddled were in fact worse than the disease. We need to reduce our greed and rampant consumption. The message of the film was to live simply, so that others may simply live!

Matchstick Models

After finishing college, I got involved in a programme that aimed at making science fun for village children. Village schools do not have labs, and all science was learnt by rote - by mugging up definitions, formulae and spitting them out in the exams. Children did no experiments. The idea was to use local, low-cost materials for teaching science. Gleaming glass beakers and test tubes were far removed from the lives of the children and they would anyway feel uneasy using them. Materials used everyday had a familiarity with which children felt "at home". Mass produced items of daily use had standard dimensions and could be used for learning science. Thus, matchboxes



5 cm (2 inch), postcards (14 cm x 9 cm) could be used to estimate length. Coins are minted with standard precision and could be used to estimate weight. A postcard weighed 2.5 g and had an area of roughly 125 cm². A single cm² of the postcard weighed 20 mg. So, one could easily make micro-weights.

Children could do exciting science experiments using simple things. Science is not hardware - burettes and pipettes. It is a way of critically looking at the world in search of new patterns. From this point of view, ordinary matchsticks and bits of cycle valve tube could become 'Mecanno Sets' and used for making basic 3-D geometric shapes - tetrahedrons, prisms, cubes and pyramids. These modules, in turn could be assembled in many different ways to make buildings or complex molecular structures.

Terrible Tetrapaks

Every year over a 100 billion tetrapaks choke drains and sewers or find their way into landfills. Tetrapaks are multi-walled laminates with several layers of plastic, paper and aluminum

Teachers and children are much more likely to use teaching aids, which they have themselves made... Making their own science models is a great way of integrating head, hands and the heart.

foil fused together. Its inseparable layers make the tetrapak the number one polluter. For recycling, the layers need to be separated. We did find many creative uses for these used tetrapaks.

One could draw a pattern; score it with a needle, cut, fold and glue it into different polyhedrons. Remove the top cover of a fruit juice tetrapak and it becomes a very handy 200 ml measure to estimate volume. Cut the pack along the diagonal and nip the right angled corner to make a foldable funnel. Many years back I wrote 'Little Toys', a book which demonstrated fifteen toys and science models that can be crafted from used tetrapaks.



Pumps from the Dump

If we seriously apply our minds, it will open up many possibilities of doing more with less. A lot of modern junk - plastic bottles, cups, refills, rubber slippers, pens etc can be reused in many creative ways to make joyous learning aids. Children could make more than a dozen delightful pumps using all kinds of odd stuff. For instance, push two film cans on the ends of a 15 cm piece of old bicycle tube to make an air pump. The opening / closing valves are made using bits of sticky tape. This high quality pump can easily inflate a balloon! Or else, make a scintillating sprinkler within a minute. Poke a broom stick in the middle of a plastic straw. Make two half cuts 2 cm away from the centre. Bend the arms and secure them in place with some tape to make a triangle. Twirl this triangle in water to make a most delightful centrifuge or sprinkler.

The universal experience is that ready-made kits are seldom used by children. They often lie unopened. Teachers and children are much more likely to use teaching aids, which they have themselves made. If millions of our children in villages and municipal schools are to learn science creatively, then they need to make their own science models. This will be a great way of integrating the head, the hand and the heart. They should be encouraged to collect junk, bring it to school and craft it into science models. This would also be an education in Earth Citizenship - as they would simultaneously be learning good science and cleaning up the Earth.

Arvind Gupta is a toymaker and science writer. He shares his passion for books and toys through his popular website <http://arvindguptatoys.com>