Learning science while playing

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Abstract. Science plays an important role in the development of the society. While walking through the small villages in India, we found that science exists everywhere. All the activities the people do have some or the other scientific principles involved in them, but the only lack was, they were not aware of them. Going to several schools and talking to several students, we learnt that the science education system was more theory based which was becoming difficult for children to remember. The science education system need to be given a new approach and had to be made more hands-on for the school kids. Science should become an integral part of day to day learning. Like a kid reads a comic book, he/she should also play with science more often. Scientific knowledge has to be made more accessible to all the segment of the society for all the ages. Manthan has been working in the field of informal science communication since past decade. In the Hands-on science forum I would like to discuss about few of the outreach projects carried out by Manthan and their impacts at different segments of the society.

Keywords. Manhan, Science, Playing

Project 1: Toys a great tool for science learning

In every different village or a town every kid plays with a toy. A toy either made by themselves or bought from the market. While surveying few of the toys from the Western Part of India, we found several locally made and available toys. Many of the toys worked on interesting scientific principles. Manthan came up with an innovative idea of teaching science to students through the toys. So there were few workshops organized for making the toys and educating the students with the same toys. Also an innovative traveling exhibition was developed which traveled at few small villages in India and also Internationally. The participatory nature of the exhibition helped the children learn the scientific concepts much faster. The children also related their toys to their surroundings bringing them close to their society.

Project 2: Astronomy on Camel Cart

Year 2009was the International Year of Astronomy and there are several activities been conducted all around the world related to astronomy. We wanted to give the benefit of the astronomical knowledge to all segments of the society in a fun manner. For this we decided to reach maximum people in an inexpensive and innovative way during 100 Hours of Astronomy. Thus after thorough brainstorming we decided to have a Mobile Camel Cart Exhibition on Astronomy along with hands-on activities which would move along the entire city and outskirt villages (25 villages) in radius of 35 km around Ahmedabad. The viewer group was very diverse and more than 2,50,000 members directly were benefited by this event. The project was designed in such a way that the camel cart would stop at any required place and the people could see the exhibition and the volunteers would conduct several astronomical activities. Several times the children would walk along with the camel cart and also join in explaining concepts of astronomy to other people from different villages. The camel cart gave them a sense of belongingness. This project was rated the Most Innovative Outreach Project in the world. This entire project was carried out as an experiment and received an amazing success. People were quite amazed and we got really great feedback from different audiences.

Project 3: Hands-on activity kits

Manthan has been developing several hand-on material for science awareness projects, scientific

Abhay Kothari. (2010). Learning science while playing M. Kalogiannakis, D. Stavrou & P. Michaelidis (Eds.) *Proceedings of the* 7^{th} *International Conference on Hands-on Science*. 25-31 July 2010, Rethymno-Crete, pp. 417 -418 http://www.clab.edc.uoc.gr/HSci2010 events and also several scientific subjects. The main aim of developing hands-on science kits for special science events and awareness events like Solar eclipse, astronomy year, biodiversity year, earthquake, etc. is to educate the children and common people in a low cost and play way manner. Every activity kit consists of 25 - 30 activities. These kits reach to the doorsteps of the registered members and also to several school and science clubs all round the country. All the material is made in vernacular languages. The students/members can learn about several concepts of science just by folding, cutting and pasting the pieces of paper given in the kits. While learning the children make their own toys related to similar subjects. The information gained of such projects is not only gained by the registered student but rather its shared in the entire families and also several friends. In the case of science clubs, one kit is used by several students and that knowledge is spreaded to all the family members and friends of the beneficiary students. Thus this multiplying knowledge helps the entire society to develop and generate scientific awareness.

Several similar projects have been carried out by Manthan in the field of Science and Society for the development in the grassroot levels.