Report on ViBha-IAPT-Anveshika Science Camp Organized from 16th to 18th, May 2014 at Hyderabad

May 19, 2014

1 Introduction

The summer brings freedom from schools. It is the most creative season in the life of students. This period can be used to create interest in science, but not at the cost of freedom and enjoyment. There is a need to create a platform where children can play with science and enjoy it. The idea of science camp originated with this.

The three-day science camp was organized from 16^{th} to 18^{th}, May 2014 to motivate students towards science by activity based learning. The event was jointly organized by Indian Association of Physics Teachers (IAPT) and Vijnana Bharati. A brief introduction of these two organizations is given below.

IAPT is an organization committed to upgrade the quality of Physics Education in India at all levels. Started in 1984, it has more than 6000 life members and is a workforce to implement a number of programmes enriching Physics education. *Anveshikas* are centers for developing innovative experiments related to Physics teaching and learning, and promoting experiment-based Physics teaching. There are 19 Anveshikas in India working under the umbrella of National Anveshika Network of India (NANI).

Vijnana Bharati is leading the Swadeshi Science Movement, which was conceived and started at Indian Institute of Science in the year 1982. Today, Vijnana Bharati has units in 22 states and has been working in 11 different areas through autonomous institutions, independent organizations and projects. The Vijnana Bharati make efforts to connect science with societal and national needs. It is a dynamic science movement with swadeshi spirit, interlinking traditional and modern sciences on one hand, and natural and spiritual sciences on the other hand.

A report of Dr. H. C. Verma, Professor at IIT Kanpur aptly explain the reason behind science camp. The report states, "Science and specially Physics is being taught since years and decades only through chalk and talk. Science education has reduced to transferring some formulae, equations and statements from the teacher's lecture notes to the student's note books via the blackboard without affecting either of the brains. This process of teaching and learning of science doesn't fascinate the students and hence learning of science becomes only a tool to get a descent-looking job. To make Physics understandable, perceivable and enjoyable, so that at least some of the students can make it a passion, we are trying to bring in innovations in teaching such as demonstration experiments during the classroom teaching and informal lab activities outside the classroom. This also gives a chance to the teacher to design newer demo experiments even if the syllabus and topics remain the same over years and years."

2 Programme Details

2.1 Inauguration

The inaugural session of one hour duration started at 9:30AM on May 16, 2014. The session was presided by chief guest Shri Shyamprasad Ji, Coordinator,Vijnana Bharati, Andhra Pradesh. Lighting of the lamp, Saraswati Vandana, and address by the chief guest were components of inaugural session. In his inaugural address, Shri Shyamprasad Ji highlighted the essence of scientific temper within India throuhout ages that created totally different outlook near to the people and provided solutions to the day to day problems.

He stressed on importance of development of scientific solutions to medical health care and looking at job creation. Inaugural session was followed by a session on scientific observation by Shri G. L. N. Murthy.

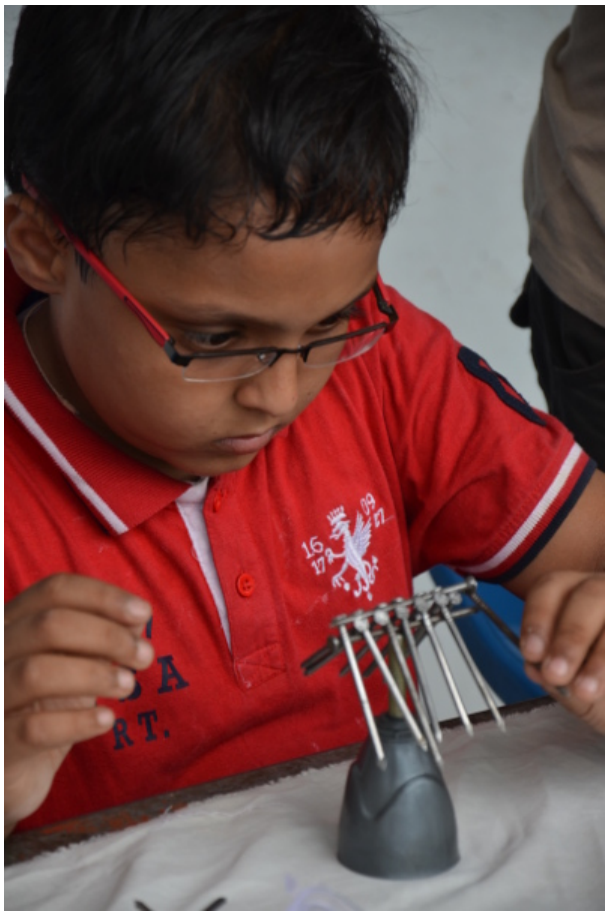
Shri Shyamparsad Ji Addressing Participants in Inaugural Session

2.2 Activities

Simple and interesting activities on mechanics, waves, optics, thermal physics, and electrodynamics were part of the programme. In total there were 54 activities on physics and 6 scientific puzzles. Most of the activities were taken from the books *Foundation Science Physics*, Bharati Bhavan. The activities were compiled in a booklet which was given to each student.

Students Doing Burning Candle and Water Rising Experiment. The textbooks generally states that height of water rise corresponds to 21% oxygen in atmosphere, which is not true.

Simple optical bench. This was used to show convergence (divergence) of parallel rays of light by convex (concave) lens.



A Student Concentrating to Balance 14 Nails on a Single Support. The juniors enjoyed balancing the nails and seniors learned about the concepts of centre of mass, torque and stable equilibrium.

Blowing up a Balloon using Acetic Acid and Sodium Bicarbonate. The chemistry is equally fascinating.

Struggling to see Convection Current in a Shoe Box.

Multiple Students Multiple Activities

Team Effort to Make Electromagnet Working. It only requires a battery, insulating wire, and a nail.

A student focusing on thermometer reading while others were attracted by other activity.

Trying to get properties of image formed by concave mirror. Getting the feel of real, virtual, inverted, erect, magnified, and diminished image.

Enjoying slow motion of the magnet falling through a copper tube. It is Faraday's law of electromagnetic induction that slows the magnet.

Solving puzzle on volume. The girls has three containers of capacity 800 ml, 500 ml, and 300 ml. The 800 ml container is filled with water. The students were asked to divide water into two equal parts by using these three containers only. The boys on the stairs are either burning paper or measuring focal length of a convex lens or concave mirror.

A student playing flute. Hope he will enjoy it more once he understand the physics behind sound produced by open and closed pipe. The frequency, harmonics and overtones differentiate one musical instrument from other and makes the music pleasing to mind.

The easiest way to measure approximate focal length of a convex lens.

This activity was not in the schedule. Hope he is trying to learn something from burning wood-stick.

Collision between balls assisted by strong magnets. In classrooms, students solve collision problems using conservation of momentum and energy but hardly get a chance to see it physically.

An activity on sound using tuning fork and a PVC pipe. The reflection of sound is similar to that of light. The echo is an example to reflection of sound.

Drawing magnetic line of forces of a bar magnet.

Verification of Ohm's law. Series and Parallel Combination of Resisters. Magnetism.

Some of the people who made the event possible. From Left: A Srilaxmi, Seema, Vimal, Jitender, Maruti, Raju, Ramakrishna, Sridhar, GLN Murthy, Joga Rao.

The uninvited guest at science camp. Permanent resident of the school.

The Lunch Break. The students spent more time in seeing convex and concave shape of the spoon. The type of image formed by two sides of the spoon.

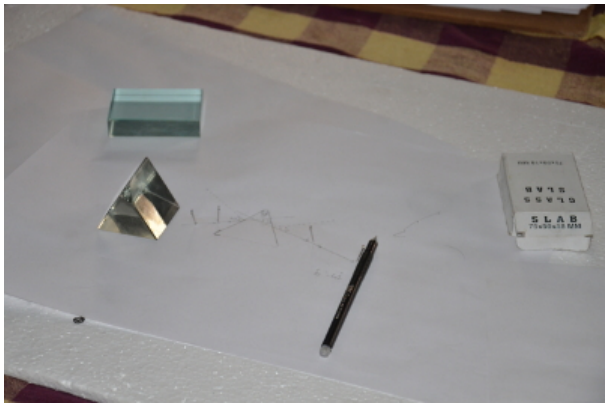
Assembled after the lunch break for a short video show.

Outdoor games involving science concepts. The students concepts like inertia, projectile motion etc while playing.

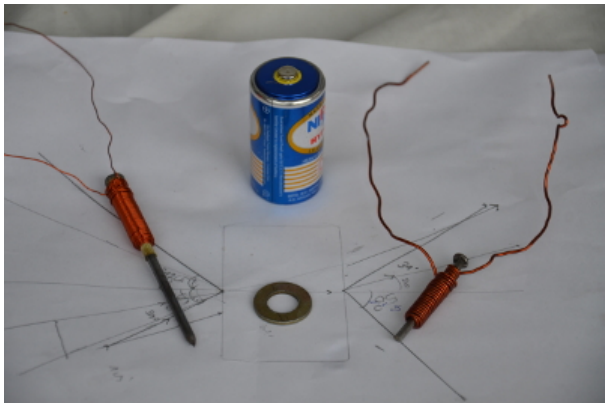
11th and 12th Class Students Tracing Rays throgh Glass Slab and Prism.

Disturbed by the Photographer.

Connecting torch bulb to a dry cell.



Glass slab and prism with some ray tracing.



Electromagnets waiting for students to come back after outdoor activities.

Conduction of heat through a hacksaw blade.

Magnets are always fascinating. So is an electromagnet.

2.3 Valedictory Session

The valedictory session was conducted on 18^{th}, May from 3:30 PM to 5:00 PM. Dr. S. Karunanidhi, a senior scientist in DRDO was the chief guest. In his valedictory speech, he emphasize the need of science and spirituality in modern society. The chief guest gave certificate of participation to the participants. Shri Subbarao Ji, Shri Chaudhary and Shri Vinay Kumar from Hyderabad chapter of Vijnana Bharti were also present. A select number of parents were invited in the valedictory function. The event was concluded with feedback from participants, Rashtriya Gaan, and Shanti Mantra.

Dr. S. Karunanidhi Addressing Participants in Valedictory Session

3 Event Planning

3.1 Registration

The banner, pamphlet, and personal contacts were used to publicize the event. The number of seats was fixed at 50. A total number of 50 students were registered, out of which 48 participated in the event.

3.2 Venue

The Sarasawati Shishu Mandir High School, Badangpet was approached for venue. The school management provided the venue and ancillary facilities free of cost.

3.3 Logistics

The logistics includes material for science activity, tables and chairs, lunch, refreshment etc.

4 Supporting Hands

The event could not succeed without sincere and dedicated efforts by the volunteer. Many people came forward and provided their services to the best of their capacities and capabilities. Most of the volunteer were professionals who spared their valuable time irrespective of commitments at office and home. The contribution of some of the volunteer is give next.

A Srilaxmi helped in coordination activities and smooth execution of the event. *Avadhanu Ji* helped in pre-event planning. *B Ramakrishna* helped a lot on both technical and managerial front. *Devi Prasad Panda* provided technical support on second day of the event. *G Sridhar Babu* was one of the resource person to help students in performing and understanding experiments. *Gaurav Singh Bawa* provided support for photography. *GLN Murthy* was key organizer. *Jitendra Ji* helped in logistic support and overall coordination. *Jitender Singh* contributed in setting up Physics experiments. *Maruti Sairam* contributed in event planning and coordination. His skills helped a lot on first and third day of the event. *Rahul Dixit* provided support for photography. *Ramu Ji* provided technical support on second day of the event. *Seema Mishra* visited the event on third day and tried to contribute her best. *School Principal and Staff* generously provided resources at the venue. *Subbarao Ji* participated in both inaugural and valedictory session. *Dr. S Karunanidhi* was chief guest in valedictory session. *Shyamprasad Ji* was the chief guest in inaugural session. *Santosh* helped on second and third day of the event. *Pydi Raju* provided support on second day of the event. *Vidhyadhar Ji* contributed on second day. *Vimal Mishra* provided both managerial and technical support on all the three days. *Vinay Kumar Ji* participated in valedictory session. There were few more volunteer who helped in one way or other. Also, a team from Bharati Bhawan publishers and distributors participated in first two days.

5 Funding

Total expenditure on the event was approximately Rs. 30,000/-. Major heads were lunch, refresment, rent on tables and chairs, equipments, etc. The registration contributed approximately Rs. 15,000/-. Vijnana Bharati funded remaining amount.

6 Media Coverage

The news related to the event appeared in The Organizer and The Jagrati Telugu Weekly.

Science fair by Vignana Bharati, Hyderabad

Hyderabad unit of Vijnana Bharati organised a science camp at Saraswati Sishu Mandir, Badangapet for children studying from 6th to 12th standard from May 16 to 18. The camp was inaugurated by Shri Syam Prasad, coordinator, Vijnana Bharati, Andhra Pradesh describing the essence of scientific temper within India throughout ages created totally different outlook near to the people and provided solutions to day to day problems. He stressed on the importance of developing scientific solutions to medical health care and looking at job creation. The students had the opportunity to experiment with more than 50 experiments on physical sciences. Focus was on learning by doing. The topics covered were sound, optics, magnetism, electronics and Thermodynamics. Many scientists working with DRDO, NGRI, IICT, Infosys also participated as resource persons.

—Bureau Report

Event Coverage in The Organizer dated 01-06-2014 on page 49.

భాగ్యనగర్ : విజ్ఞానభారతి ఆధ్వర్యంలో ఐడంగ్‌పేట శిశుమందిర్‌లో 6నుండి12 తరగతుల విద్యార్థులకు 'అన్వేషికా' అనే పేరుతో వేసవి సైన్స్ శిబిరం మూడు రోజులపాటు జరిగింది. విజ్ఞానభారతి కోఆర్డినేటర్ శ్రీ శ్యాంప్రసాదు శిబిరాన్ని ప్రారంభించారు. DRDO, NGRI, IICT, Infosys -వంటి సంస్థల శాస్త్ర వేత్తలు విద్యార్థులకు విజ్ఞాన తరగతులు నిర్వహించారు. ఈ సైన్స్ శిబిరంలో విద్యార్థులకు 50రకాల శాస్త్ర ప్రయోగాలలో శిక్షణ నివ్వడం జరిగింది.

Event Coverage in The Jagriti Telugu Weekly dated 14-06-2014 on page 2.

7 Further Resources

References

[1] Soft copy of this report can be downloaded from here `http://concepts-of-physics.com/anveshika/events`.

[2] High resolution pictures of the event can be downloaded from here `https://plus.google.com/photos/116638005110967953535/albums/6027431651557754513`