

Report on the 'Workshop for Teachers of Science and Mathematics' @ IWSA, 3rd to 7th June 2024

The Science Awareness Committee of the Indian Women Scientists' Association at Vashi, Navi Mumbai, conducted a five-day workshop for higher secondary school and junior college Science and Maths teachers (from CBSE and SSC boards) from 3rd June, 2024 to 7th June, 2024. Twenty-three participant teachers from various schools of Mumbai, Navi Mumbai, Bengaluru, Pune, Jamnagar and Ratnagiri participated in this Workshop.

Dr Lalitha Dhareshwar, Trustee, and Dr Sheela Donde, Convener of the Workshop, welcomed the participants. In his inaugural address Dr. B. N. Jagtap, President of the Indian Nuclear Society, encouraged the young teachers to undertake a comprehensive approach to teaching, and advised them to address the all-round needs of students in one integrated learning format.

On the first day of the Workshop, more than forty different Physics experiments were demonstrated by Prof. B. Chakradeo, Dr Lalitha Dhareshwar and Dr Devaki Ramanathan. The demonstrations were very interactive, and teacher participants volunteered to do several of them hands-on.

On the second day, Chemistry concepts were demonstrated through simple experiments by Ms. Sujata Haralkar, Ms. Tripta Tewari & Ms. Sudha Somani. Prof. D.V. Prabhu explained the role of catalysis in sustainable /green Chemistry while Dr Shyamala Bharadwaj talked about the various renewable energies for transition towards a more sustainable energy future with special emphasis on the Geysers of New Zealand.

On 5th June, 2024, the third day of the Workshop, was devoted to Environmental Sciences and Computer Science. The morning session commenced with an explicit talk by Dr Seema Das on "Climate change and its impact on water quality". She also demonstrated, by doing simple experiments, how students could analyze the quality of water from different sources, for the presence of chlorine, calcium ions, dissolved oxygen and estimate the biological oxygen demand of the water. This was followed by a highly appreciated garden trail of IWSA's learning garden and garden kiosk by Ms. Priya Jacob and Ms. Sukhvinder Sandhu. Dr Sweedle Shivkar gave a talk on using various tools, techniques, and methods to create interest in environment education. Dr Srirupa Mukherjee demonstrated how to make natural flower-based beverages which could prove to be both eco-friendly and healthy. Ms. Sakina Gadiwala concluded the session with a demonstration of the process of making natural bioenzyme multipurpose cleaners. During the afternoon session on Computer Sciences, Dr Seema Purohit emphasized how students and teachers alike need to be aware of "Cyber security". She later conducted a hands-on session on the "Use of Generative AI in Education".

6th of June, the fourth day, comprised of Biology-based sessions. Dr Manisha Karpe talked about three types of animal husbandry approaches: Apiculture, Sericulture, Pisciculture, and gave details about doing Hydroponics. She had several exhibits related to these that the teachers could see, touch and photograph excitedly. Dr Karpe conducted hands-on experiments to identify a Barr body and check for pollen germination using a compound microscope. Ms. Priya Jacob showed how simple DIY working models could help children understand the transportation in plants and Ms Madhu Pahwa used a simple DIY model to clear some misconceptions regarding the structure of a plant cell. Dr Nilima Mulgund explained the working of the various bones of a human skeleton whilst Dr Karpe showed various embalmed human organs. Dr Surekha Zingde, through her talk, re-emphasized an integrated approach to science teaching, about how the boundaries between the different sciences are getting blurred, and mentioned the need for teachers to upgrade their knowledge about the advances that are taking place in science and technology research. Dr Nilima Mulgund guided the teachers on action research and report writing. Dr Sheela Donde gave an overview on Mendelian Genetics and

Inheritance patterns. Dr Seema Das demonstrated and inspired teachers to carry out simple demonstrations of heart beat in Daphnia and wet mount of chick embryo.

The final session on 7th June was at Homi Bhabha Centre for Science Education, where the teachers were shown how mathematical concepts could be taught using various games and craft activities. Dr Savita Ladage, Dean of HBCSE, in her valedictory address gave several illustrations to distinguish between concepts and facts. She also shared with the participants several interesting websites that can help clear basic misconceptions in the various sciences and how several simulated experiments could be performed by the students. The participants gave very positive feedback of the entire Workshop, and said it was a wonderful learning experience for them.

The entire proceedings of the 5-day Workshop, were compiled by Dr Suparna Kamath, in a very well-illustrated Handbook, with details of all the experiments that were conducted, and abstracts of all the lectures that were held. This Handbook was distributed to all the teacher participants, for use in their respective institutions.

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