

**HANDS-ON TRAINING ON  
SCIENCE & MATHEMATICS**  
**FOR RMSA SCHOOL TEACHERS**

By



A three day workshop on hands-on science was conducted by Edugenie for high school teachers from RMSA schools from 19<sup>th</sup> to 21<sup>st</sup> September, 2017 at Pastoral Centre, Shillong. The program was supported by Rashtriya Madhamik Siksha Abhiyaan (RMSA), Meghalaya.



The program focused on innovative learning techniques to improve science education in Meghalaya.

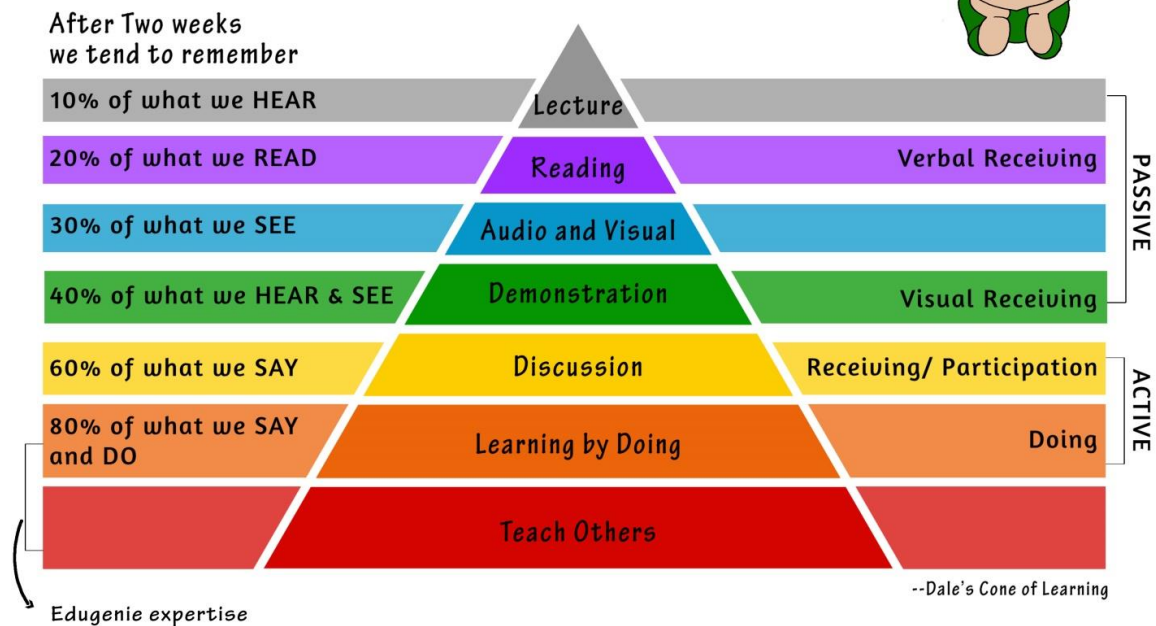
Various activities were performed to discover amazing ways to make the classroom dynamics interesting and effective. The focus was laid on the following points:

1. Science should be learned only by doing and understanding
2. Throughout integration of scientific method is a must for school children to develop scientific temperament and become real life problem solvers
3. In learning science, our environment becomes our laboratory.  
Construction of some very simple teaching learning manipulative from simple day to day components make learning more applied and interactive

4. Model making is also an important aspect of science learning. Some simple readily available materials coupled with creativity can transform to amazing models depicting important science concepts.
5. Throughout assessment ,by adopting some creative tools like loopy cards and *gamification* of lesson plans helps in identifying and continuously bridging gaps

A brief description about this three day workshop is covered in the passages below.

## CONE OF LEARNING



As described by Dale's cone, hands-on learning helps in better retention of concepts taught. Not only this, hands-on learning also promotes interest and peer learning. An ideal science classroom should be fun and hands-on. The results of experiments performed should be measurable and should have some real life applications.

However, it is not easy to bring such drastic shift in the classroom dynamics. Here it is required to be very selective in terms of activities, examples and follow up questions. So, the following activities were performed to understand the selection procedure.

## Activity 1: Chemical reaction between metals-Aluminium, iron, copper and zinc and their sulfate salts

### Features

- This activity covered multiple concepts like- displacement reaction and reactivity series, characterization of chemical reactions, salt identification by physical investigation, understanding water of crystallization, etc.
- No expensive set up was required. The experiment required some basic chemicals which can be easily procured or could be provided in a simple chemistry kit.
- The experiment can be easily conducted in the classroom with negligible set-up time
- Both quantitative and qualitative observation could be made



## Activity 2: Structure of atom using paper plates and play- dough

### Features

- This activity explained the chronological development of structure of atom covering all historical co-relations
- The basic features like duration of the activity (one class period), low cost materials and ease of implementation was taken care



Several other activities were conducted to cover concepts of high school science.

Resource Person for the Science workshop:

1. Dinesh Lahoti, Director, Edugenie, Guwahati
2. Khushboo, Curriculum Head, Edugenie, Guwahati
3. Tanima Paul, Head of Science division, Edugenie, Guwahati

Glimpses of workshop:



A similar training on Mathematics was also conducted with Hands-On methodology for RSMA Teachers from 20<sup>th</sup> November to 22<sup>nd</sup> November, 2017 at Pastoral Centre, Shillong

Glimpses of workshop:



Teachers experiencing the stability of 2 Shapes and various properties of Polygons. Teachers made complex 3D solid Structures which are hard to visualize and the verified the relation between the vertices, faces and edges of 3D Solids (Euler Formula).



Hands-On Activity on understanding area of polygons and factorisation



Hands-On Activity on understanding the Arithmetic of Negative Numbers





Hands-On Activity on understanding the concepts of volume, curved surface area and total surface area. Exploring and verifying the volumetric relations between the solids.

Resource Person for the Mathematics workshop:

1. Dr Vivek Monterio, Advisor, Navnirmiti Learning Foundation, Pune
2. Geeta Mahasabde, Director, Navnirmiti Learning Foundation, Pune
3. Dinesh Lahoti, Director, Edugenie, Guwahati