

ABOUT THIS MANUAL

Good science education is true to the child, true to life and true to science.

—National Curriculum Framework – 2005

Learning science should have two essential components: an understanding of the body of knowledge and also the processes by which this knowledge is constructed, established and transmitted. But the current status of school science in our country barely satisfies only one of these components and grossly downplays the other. In other words, our system is loaded with product attainment–rote memorisation of facts of science, rather than laying emphasis on the various processes that lead to the generation and accumulation of the concepts of science.

Research has shown that young children are not concrete and simplistic thinkers; they show surprisingly sophisticated and diverse thinking abilities. They also possess a substantial knowledge of the natural world. Therefore, the feeling among certain educationists, that children’s minds are empty vessels awaiting enlightenment by way of instructions from a teacher, is a grossly untenable argument. By the time children reach the upper primary level, they would have come through years of cognitive growth and would have developed the innate ability of different ways of understanding and reasoning about the world around them. In the wake of these realities, science teaching-learning has also undergone far reaching transformation in the past few decades. It has seen a paradigm shift from being teacher-centric to child-centric; from a mere, dull transmission of information to knowledge creation; from passive commentaries in classrooms to vibrant, interactive, activity- based learning; from rote memorisation to creativity, experimentation and experiential learning.

HOW TO MAKE TEACHING-LEARNING OF SCIENCE EXCITING?

Isn’t it exciting to see a piece of magnesium ribbon burning rather than read and memorise how it burns? Isn’t it thrilling to open up a flower and observe its parts rather than read about it in the text? How fun-filled and exciting it would be to hold an ice cube in your palm, (screech and

scream you may) but also observe how solid ice melts into liquid water!! The list of such thrilling experiences that we can plan in a science class is endless.

With an objective of making learning in schools exciting and also building scientific facts based on the child's day-to-day understanding of the world, the *National Curriculum Framework – 2005*, suggested a constructivist paradigm for teaching-learning in our schools. In order to assist the schools/teachers and children, the NCERT has prepared textbooks in science which have an inbuilt, activity-oriented and child-centric approach. It is a known fact that most of our rural schools have no laboratory facilities, and the children are put to great disadvantages because they are deprived of the excitement of performing activities. Keeping these ground realities in focus, we have suggested activities of a very simple nature so that they can be easily performed by the teachers or students with minimal equipment and materials. These activities will help children to learn concepts of science more effectively. It will also stimulate the young minds towards a path of scientific pursuit. Over a period of time, this will help them to build a scientific attitude with all its necessary ingredients like observations, hypothesizing, experimentation, analysis, evaluation and drawing conclusions.

In the present Science Textbooks for Classes VI, VII and VIII, the scientific concepts are framed not along disciplinary lines, but are organised around Themes that are potentially cross-disciplinary in nature. The Themes are – Food; Materials; The World of the Living; Moving Things, People and Ideas; How Things Work, Natural Phenomena and Natural Resources.

Although our textbooks provide numerous opportunities for activities, it was felt that the teachers and students may be provided more details and elaborate explanation for conducting some key activities. In order to satisfy this need, the present Laboratory Manual of Activities has been prepared. An attempt has been made to make this manual a student-friendly. The manual also demonstrates ways in which an activity can be modified or extended further into a simple project that can be undertaken by the child herself. Children must be encouraged to undertake simple, time-bound projects as this will set them on a path of discovery and experimentation even outside the classroom. The subtitles of each activity are such that they reflect a seemingly direct dialogue with the child. For instance, 'What we have to do', instead of the conventional subtitle Aim, addresses the child directly, and instantaneously brings into focus the child's inquisitiveness. Similarly, all other titles have an underlying didactic overtone. Each activity carries a 'Note for the teacher' wherein, teachers are given suitable clues to deal with queries from children and precautions in performing activities.

Suggestions have also been given for alternative material and even alternative activities to help them perform their work more effectively.

BENEFITS OF THE CHILD-CENTRED, ACTIVITY-BASED APPROACH TO LEARNING

- Develops scientific temperament and strengthens curricular concepts;
- Nurtures creativity and innovation;
- Develops logical and analytical thinking;
- Improves observational skills;
- Builds confidence and motivation;
- Provides joyful and meaningful learning experience.

“Science is built up of facts, as a house is with of stones. But a collection of facts is no more a science than a heap of stones is a house”

Henri Poincaré,
La Science et l’Hypothèse (1908)

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