

## Small Science Series: Textbooks, Workbooks and Teachers' Books for Classes I to V

### *Authors of the books:*

Class 1 and 2 - Jayashree Ramadas, Aisha Kawalkar & Sindhu Mathai

Class 3 and 4 - Jayashree Ramdas

Class 5 - Jyotsna Vijapurkar

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### *A Review by Uma Harikumar*



Efforts in curriculum reform and innovations have been in effect over the decades and significant progress has been made in that direction. However, the overall deterioration of the system, due to extraneous factors, has obscured these gains. There exists a large gap between the generally agreed upon objectives of the curriculum and their actual translation into textbooks and teaching practices. The Homi Bhabha Curriculum and the Small Science Series of books (textbooks, workbooks and teachers' books) is an effort to bridge this gap. The curriculum aims to make the students develop a lively curiosity about the world around them, with a will to unravel answers through observations and enquiry. Its purpose is to ignite the minds of children, kindle their curiosity and develop in them a scientific temper.

The first few years of schooling are critical in shaping the child's attitude towards learning. The experiences at this early stage decide as to how they will perceive school learning. Will they see it as passive absorption of uninteresting, unrelated information or as a quest to understand and unravel the mysteries of the world around them?

The Small Science Series is intended for children in primary school, mainly classes 1 to 5. The topics in Class 1 and 2 cover environmental studies, and Classes

3,4 and 5 are primarily concerned with science, though keeping in view the social and cultural perspectives. The topics begin with everyday experiences and immediate surroundings, for classes 1-3, moving gradually outwards. Classes 4 and 5 make interesting use of measurement concepts.

The textbooks of class 3 and 4 interweave a story about two curious children Mini and Apu, who learn a lot by doing things and asking questions. The text, which follows this narrative, encourages students to observe the world around them, seek answers to questions, and to raise their own questions.

The language is simple. There is a well-planned effort to engage the child in exploratory and hands-on activities, to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc. The illustrations are very child-friendly, with a lot of stick figures and simple, straight line drawings, which convey the concept in the simplest manner possible. The illustration of the digestive path in the class 4 textbook has an adjoining diagram of a tomato being digested. I found this very relevant since a child can relate the path taken to the things she eats!

The topics are so arranged as to make the child curious about social phenomena, starting with the family and moving on to wider spaces. The textbooks as well as the workbooks maintain the interest of the child

throughout the curriculum. There are things to do, as well as things to observe and come to your own conclusions about.

The books do not look at science as being only a part of the school classroom learning process; definitely not some syllabus to be completed on time! They bring a lot of the world 'outside' into the realm of the classroom, which impresses upon the learner that science is a basic part of life. Our lives are but part of a scientific process! There is ample scope for the child to relate the topics of the curriculum to her/his day-to-day life and embark on a quest for knowledge. The books and workbooks help to systematize and express clearly the rich interactive experiences with the natural world that a primary school child has and contribute to her/his learning.

The curriculum and the books move away from the notion of giving information on something to developing the skills that are needed to study science and, consequently, understand the scientific process. There is a thrust on observation and recording even in classes 1 and 2. Activities like "Observe plants, flowers, leaves, leaf margins, colour of flowers, number of petals, any other structure" are interesting. Whether it is through the growth of a plant, the weather, or the amount of rainfall, a lot of emphasis has been laid on measurement. Drawing pictures and making entries in tabular form, provide the basis for entering statistical data later.

Discussion, listening, talking, expressing opinions, finding out information from/opinions of other people, are also skills that have been addressed. It may be, for instance, finding out what to do to stop the increase of mosquitoes or asking people why they like to travel.

There are a number of questions in the books, which help develop critical thinking. For example:

Which set of sticks would you choose to make a 'H' shape?

The books also help in demystifying a few myths, and questioning prevalent superstitions. For example, it discusses the question: Do snakes really drink the milk offered?

The outcome of the planting activity in class is to infer that all cereal plants are types of grasses. I thought that was a great way to make hypotheses and inferences.

There is a lot of improvisation, making things and doing experiments: e.g. making wind vanes, percussion instruments and many, many more.

#### The Workbooks

The workbooks weed out the need for classwork and homework books, reducing the burden on the young shoulders! Workbooks have been created for classes 3-5. They supplement the textbook and help the child to record observations made during the experiments.

Every chapter of the unit has something to observe, something to record, something to find out, something to think about, questions to answer, comparisons to make, vocabulary enhancement through writing of poems, writing sentences about something, as well as making sentences with new words.

The assessment sheet at the beginning of each unit is very comprehensive; the teacher needs to assess the student with reference to skills of observation, design and engineering, oral language, written language, quantitative thinking, enthusiasm in doing activities, patience and concentration, independent thinking, cooperation with other students and completion of home assignments.

#### The Teachers' Books

The teacher's handbook is very exhaustive and has all the relevant information, given more to facilitate questions posed by curious children. There are clear guidelines given on all that has to be dealt within the classroom, as well as the assessment process. It also addresses students' alternative conceptions and methods to deal with them. Every activity has been looked into with a lot of thought, and ways of making them as interactive as possible have also been explored to a great extent. However, nothing is prescriptive and there is a lot of liberty given to the teacher to use locally available material or content. There are many interesting questions suggested, for the teacher to pose to the class and make the lesson interesting.

There is a list of books given for further reading which is invaluable to the teacher. Every topic has been dealt with in so much detail that one has to read it to believe it! They build confidence in a teacher and motivate him/her to perform better - truly a precious resource for teachers!

To create a curriculum, write textbooks, workbooks and teacher's manual is a Herculean task. The authors, Jayashree Ramdas, Jyotsna Vijapurkar and their team, have indeed undertaken this daunting task and created a very interesting series of books that perhaps every school needs to get, in order to make science classes a

source of joyful learning. As Jayashree herself puts it "Small science series are books that are not be read but to be *done!*"

For more details about the books, you could visit the website: <http://www.hbcse.tifr.res.in/smallscience>. Full versions of the book, in Hindi and Marathi, are also downloadable from the website.

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