As teachers, before we take up the issue of teaching biology in primary school, let us understand its place in the primary curriculum. At the primary level, children need to develop three kinds of academic skills. Communication skills are developed by learning languages while logical thinking skills are developed by learning mathematics. The purpose of learning environmental science or EVS is for the child to understand the world around it.

The world around a growing child can be divided roughly into the Social World and the Physical World. The Social World includes society and the family and this later becomes part of Social Studies in the middle school. The Physical World is the living and non-living world which the child can see, touch and experience.

The study of the non-living world later develops into the study of physics, chemistry and physical geography in the higher classes. The study of the living world becomes biology in the higher classes. Hence in primary school, biology is the study of the living beings a child sees in the world around it.

The next question is, ‘What should primary school children learn about the living world around them?’ If we remember the following facts about children in primary school, certain approaches would automatically suggest themselves:

- Primary school children, who are typically below ten years of age, are still in the ‘Concrete Operations’ stage of Piaget developmentally. Hence, they cannot grasp abstract ideas very easily. They are more comfortable with what they can actually experience with their senses; what they can touch, see, taste, smell and hear.
- They cannot concentrate or sit quietly for long periods of time. They need to be physically active. They learn more from hands-on work than from listening to oral lectures. They learn more easily from peer group interaction than by listening to the explanations of a teacher.
- They come with a fund of knowledge and also a lot of misconceptions about the world around them, which they have gathered by actual interaction and experience with the world around them. Their sense of time, space and causality is still developing and hence they may have difficulty in grasping ideas in which the above concepts are involved.

Keeping these in mind, some of the educational experiences through which children can learn biology are field visits, classroom activities, and experiments and discussions on what they have observed during their field visits or classroom activities. The discussions can be about comparing and contrasting living things on the basis of their observations. Classroom activities can also include expressing their understandings through art, music, dance, drama and craft.

Here are some ideas for field visits

1. Visit a garden or a farm or a market to learn about plants and birds
2. Visit a zoo or a village to learn about animals
3. Visit an aquarium to learn about fish
4. Visit a nearby water body – lake, river, pond, or beach.

What you can get the children to do on field visits
1. Collect twigs, leaves, flowers and seeds of different colours, shapes, and sizes and associate them with different vegetables and fruits
2. Collect feathers
3. Collect bird nests
4. Survey plant, animal and bird life in the surrounding areas

**Ideas for classroom activities and experiments**

1. Maintaining an aquarium in the classroom
2. Germinating different kinds of seeds
3. Documenting the entire life cycle of a vegetable from seed to seed
4. Making fresh salads of vegetables and fruits
5. Watching wildlife videos
6. Celebrating pet day. Children can bring their pets to school and talk about them
7. Enacting stories from the Panchatantra, which talk about animals, plants and birds

**lucky-seed-roleplay**

I would like to relate here a role play that I did with my children. It was a lesson about the life journey of a seed which we turned into a story called ‘The Lucky Seed.’ “A farmer goes on a bullock cart to the village market to sell a bag of seeds from his farm. On the way, when one of the wheels hits a big stone, one seed falls out of the bag, along with a handful of seeds, on to the hot dry ground below. The seed now feels scared that it may die. Just then a buffalo passes by and stamps on it, pushing it into the soil. The seed then feels thirsty and wants water to drink. Suddenly a light drizzle begins. So the seed is able to quench its thirst. Later the sun comes out shining brightly. Using the energy from the sun, rain and air, the seed grows and gets its new shoot. Then a hungry bird which is flying by sees the tender shoot and tries to eat the first new leaf. The roots are so strong that even though the leaf is partly eaten, the seed remains under the ground. The hungry bird then flies away to a different destination. With continuous sun and rain the seed slowly becomes a big plant. After a few months the plant becomes a big tree and starts sprouting flowers. Then the flowers turn into fruits. Fruits contain plenty of seeds. The mother seed is very happy to see its thousands of children.”

The story narration was followed by a play using stick puppets. The children were taught to make stick puppets of the different characters involved in the play like the seed, the farmer, the bullock cart with wheels, rain, sun, wind, shoot, single leaf, plant, flowers and fruits and a big tree. The play ended with a dance and a song based on the Lucky Seed story.

It was a good learning experience for the children. After the role play, the children were easily able to understand the following concepts and remember them too.

1. The life cycle of a seed
2. The importance of sun, air and water for seeds to grow into plants
3. Out of the thousands of seeds produced by a plant, only very few ‘lucky’ones survive to become plants

The role play also improved their confidence and helped them build the ability to express themselves. We did a similar play on the life cycle of a butterfly. Gradually children learned to write their own scripts for plays.

While carrying out the above activities the focus must be on developing the following skills

1. Understanding oral instructions of the teacher; this could be a single instruction or a series of instructions. An example is the instruction that the teacher will give before going on a field visit to observe a tree.
2. Observation of a thing or a process using simple tables and charts where necessary. For example, the observations of the germination of a seed can be kept in a day-by-day diary with dates.
3. Setting up simple experiments using a variety of everyday materials and equipment. An example is to set up an experiment to see the effect of sunlight on the growth of a plant.
4. Documenting observations either in writing or through sketches. While looking at the shapes of leaves of different trees, the students can write a verbal description accompanied by a rough sketch.
5. Asking questions to clarify doubts.
6. Speaking about the observations or experiences, using simple but correct scientific terms.
7. Understanding the important concept to be learnt from the activity. For example, the important concept in the Lucky Seed is that out of a million seeds which are produced by a tree, only very few survive the many dangers which seeds encounter.
8. Expressing the understanding verbally or through other means of expression.

The aim of biology in primary school is to make students aware of the surroundings and to enable them to understand simple basic concepts. The aim is not to fill them with a multitude of facts through memorizing without any understanding. Hence, understanding of a concept or a process should be done before learning scientific terms like germination and photosynthesis. Stress should be more on basic concepts rather than on memorizing a number of facts or names. Since children like to hear stories, stories of scientists who were associated with discovering some of the concepts being learnt, would enable children to add flesh and blood to the concepts and help them to remember them.

I strongly feel that a textbook is unnecessary since students will not be able to read a book on their own. If there is a textbook, then there is a tendency to give questions and answers based on the material in the book and make students memorize unnecessary facts. If a textbook must be used, let it be used more as a guide for the teacher and only as a reference book for the students.
THE LUCKY SEED

(sung to tune of The farmer in the dell)

The farmer wants to sell the seed
Heigh oh the Derry oh
The farmer wants to sell the seeds

He carries a bag of seeds
He is sitting on the cart
The wheel breaks on the way
The seed falls off the ground
The seed feels sad
A buffalo stamps the seed
The seed goes into the ground.
The seed feels thirsty and scared

The rain begins to fall
The sun begins to shine
A shoot begins to grow
The bird comes to eat
The roots are very strong
The seed becomes a plant
The plant becomes a tree
The tree makes its own seeds
The seeds are very happy

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