

Part 2

Workshops



The contents or parts thereof may be reproduced for classroom use but may not be reproduced for any other purpose without the permission of Centre For Learning or the author.

From Philosophy to Practice

Workshops conducted at the CFL conference, 2006

Educating for a Sane Society

This section of the document contains details of the more practical workshops offered in parallel sessions on three afternoons of the conference. These workshops were an attempt to demonstrate how a philosophy of education might be actualized in practice. In addition to handouts, each workshop had a strong hands-on interactive component, which we are unable to reproduce here. In spite of this, we feel that the handouts themselves are very illuminating for teachers. Except for drama, creative writing, toy-making, senior school mathematics and physical education, all the workshop material presented here was created by teachers from CFL.

This part is divided into three sections. The first contains material appropriate for all age groups of children. The second contains descriptions of activities suitable for junior age groups, and the third section is for the middle and senior age groups.

We would like to thank Jane Sahi, Vidula Mhaikar, Stefi Barna, Vijay Padaki and Shailesh Shirali for holding workshops and helping to create material for this document.



Section One: General Workshops

Dialogue in Education

At CFL one of the most important aspects of our education is the dialogue class. Holding a dialogue class with children is a difficult skill to be conveyed in a workshop mode. There are no fixed techniques, yet there are guidelines and principles that we have come upon with years of experimentation and experience. There are absolutely no guaranteed outcomes, as it is a totally open-ended and investigative process. However, we were not deterred by these challenges, and we prepared three workshops on dialogue in education. The value of these workshops lay also in the discussions that were shared, which cannot, unfortunately, be reproduced here.

Preamble

Each one of us has a certain perception regarding a situation. Clearly, one person's perception and expression may or may not make sense to another. The attempt to communicate and understand others, setting aside our own images, ideas and preconceptions and listening without a barrier, may be termed a dialogue.

The process of dialogue is not merely an external, verbal one. A vital part of dialogue is to observe and understand our own conditioning and the workings of our own minds. Since society and the individual are reflections of each other, it is essential to begin to understand the workings of our own psyche and the patterns of our own emotions if we are to begin to explore social issues and problems. This open ended self enquiry is essential for a dialogue to have real meaning; otherwise, communication becomes simply a matter of trading opinions and ideas without moving together. In the realm of education, dialogue becomes a powerful tool at several levels.

A meaningful dialogue between individuals rests primarily on the conditions under which it takes place. The ability to listen to another person and a recognition of the rights of others to participate are important factors that can affect a dialogue. Even more important are an atmosphere of trust and a lack of fear between individuals. To be meaningful, the atmosphere must be one of critical enquiry that is at the same time non-judgemental. This necessarily also demands transparency between individuals. Structurally, it requires a non-hierarchical democratic setting that is sceptical of traditional systems of power and authority.

Such a process of enquiry and dialogue can play an immense role in a child's

life. Today's world, with its diverse and enormously powerful forces, can easily overwhelm a growing child. Only an open atmosphere based on trust can provide a setting where a young person can not only question rooted beliefs handed down through generations, but can also develop the ability to look inwards and question herself. An openness and freedom to question and express one's perceptions without fear creates room for a healthy relationship to grow between individuals regardless of age or status.

There are many challenges facing an educator who wishes to facilitate dialogue. She needs enormous patience to listen to the emerging viewpoints. She also needs a deep commitment to engage with both questions and personalities. All traditional roles, teacher/student, old/young, mature/immature, need to be abandoned if the dialogue is to proceed in an atmosphere of affection and trust. The educator must learn the art of holding her perceptions and images of young people lightly and not jumping to conclusions.

Dialogue is a difficult process and can break down for several reasons. Often our emotional responses to situations are so overwhelming that we find it impossible to communicate in a free and open manner. To be able to hold an emotional response lightly and yet engage with a question intelligently is demanding. Remaining wholly engaged with the issue at hand requires tenacity and commitment.

It is important to recognise that dialogue is not a technique to achieve a particular end. We cannot have a dialogue with a motive or with an end result in sight, whether it is correcting student behaviour or promoting a kind of moral education. Dialogue is not about transferring simple messages and codes of conduct. Rather, it holds out the possibility of a profound scepticism that encompasses all aspects of our social and personal lives and that, ultimately, questions our selfhood and private emotions in the strongest manner possible.

Dialogue with Younger Age Groups:

The child between the ages of six and ten

Dialogue with this age group can relate to various aspects of the life of the children. These can be social, interpersonal, emotional issues or even those to do with their day to day activities. When looking at dialogue with children of this age group we first need to get a sense of who and where they are and what they consider important.

Their understanding is very literal and they can relate with concrete examples and issues. Therefore one cannot speak to them in abstract terms. For example, one cannot talk about psychological hurt in general but we need to give exact and specific instances. "You have hit him. How did it make you feel? How did he

feel? How would you feel if someone hit you?”

The children are absorbed in their own world and can relate easily with their immediate world. It is important that we talk to them from where they are. For example, one cannot talk to them about responsibility unless it is at their level and by giving them examples. “Can you wash your plate well? Please make sure you come to class with your books.”

They do not see the consequence of what they are doing. They act instantly, sometimes even without thinking. For example, to use hitting as an example, children don’t realize that the other child who has been hit will be upset.

In CFL, this group of children meets for dialogues as and when issues/questions come up and are initiated by either the adult or a student. Of course, there are numerous instances of unplanned and spontaneous dialogues or one-on-one interaction to explore the nature of their behaviour and habits. For children who are a bit older, i.e. 8 -10 years of age, there is a formal weekly class set aside for the purpose of having such dialogue. Besides this scheduled time, dialogues take place over lunch, during academic class (if the need arises), or while going on a walk, etc.

Most of the time issues are communicated with them through questioning rather than telling them what to do. We feel that through the questions raised by the adult, the child will see the situation for himself. One element we must realize is that in CFL, the most number of new students are in the junior school. This poses a challenge, as trust, which is the basis of dialogue, needs to be re-established each year with the new children. It is with this relationship that the children can work as a cohesive group.

Some of the issues we have addressed are:

- cooperation among peers and others as well
- being responsible for themselves and the place they are in
- getting angry with one another and their responses
- caring

The ground for dialogue

We feel it is important for a certain atmosphere to exist for this kind of open dialogue to happen. The environment should be such that:

- there is trust between the adults and children and the children feel that they are not being judged
- there is no formal hierarchy in the adult group. The children feel encouraged to feel like equals in the realm of dialogue, so that they are open and do not feel

there is authority.

- there is interaction in formal and informal settings: in the classroom, playing games, eating a meal together, etc

Challenges we face

- Finding the balance between being a guide and a friend. We adults are constantly trying to strike this balance in our everyday structured and unstructured interactions with the children
- We adults often have an expectation for change in a short period of time, even in behavioural patterns or habitual situation. Both the children and adults need to move towards acceptance of “what is” and not push towards solutions for every situation
- We continue to try various ways to engage children who are not participative or responsive to these dialogues at either the individual or group situation
- Our close contact with parents is vital and we need to ensure that there is an ongoing communication of the school’s concerns

Points to remember:

- Be patient and listen.
- Use different tools: reading, writing their thoughts and feeling, sitting silently, etc
- Allow long silences during discussions
- Let dialogue meander, not ramble
- Be a facilitator and let children talk freely

Extract read to the children from ‘Krishnamurti for the Young’

“There were hardly any ripples on the water, there was hardly any breeze; the river was very, very still. It was really quite extraordinarily beautiful; the distant dark shore; the moon almost silver bright, polished; Venus, the morning star, still bright; and completely quiet water. And there was a fisherman, in a boat, rowing.”

Child’s comment: “I knew the fisherman was going to come and spoil everything!”

Children’s response to dialogue sessions (dialogue class)

“We can at least tell the teacher about our feelings. I like talking about good things in the morning.”

“I like talking about nice things but unfortunately sometimes we have to talk about bad things.”

“I think we have dialogue class because all the teachers can’t take it anymore.”

Talking with our Children: Middle school groups

If you're like most of us, it has been a very long time since you were 11 to 14 years old. The Middle School child's thoughts and feelings may be difficult for us to remember or imagine, but we must make every attempt to do so if we want to communicate effectively with the children.

What do you think the characteristics of the Middle School child are? Some of the more important and obvious things we have noticed over the years are listed below. You may have your own observations, specific to your time and place.

- Emerging sexuality
- Intense peer interactions
- Hero/heroine worship
- Quite judgemental about others
- Interested in the world at large

What would it mean to dialogue with these children? A great deal depends on the relationship between the teachers and students. When there is an atmosphere of trust and affection, open dialogue is the general mode of interaction in school; it pervades all activities. But there is a value, we find, in keeping time aside especially for the teacher and students to come together to talk about questions of life and living.

We meet in this semi-formal way once or twice a week. Questions or topics for discussion can be brought up by anyone, teacher and student alike. When we sit down to talk to students at this age, we follow some simple guidelines. These must, of course, be modified to suit the particular conditions in your school, but the spirit of each guideline must be held in our minds for meaningful dialogue to take place.

Creating the conditions for meaningful dialogue

Being a moderator for a dialogue class is a balancing act! You have to walk the razor's edge between several contradictory demands. It may seem impossible, but in fact when you hit that balance it can be smooth and effortless. There are always difficult moments and confusing situations, but these should never put us off our intent, which is to communicate with our children about some of the most important and serious matters in life. Here are some of our guidelines.

Ideally dialogue classes should happen with the class teacher, or someone they have a lot of contact with. This helps them open up more, and augments the teacher-student relationship outside class as well.

We sit in a circle together. We sit comfortably, but not casually. This is quite important as it brings in a necessary attitude of participation and seriousness.

For a dialogue with this age group, the adult is clearly the facilitator and often the initiator as well. You will give direction to the discussion, but not to the extent that you are constraining it. You might well ask: why give direction at all? Why not allow it to be a free flowing 'chat session'? Time can certainly be given for chatting too, but everyone feels a sense of coherence and satisfaction when the dialogue has remained focussed.

There needs to be a flow between the particular and the general. You can give space for stories and examples, which children of this age still love to relate, but by all means gently guide them back to the question at hand when they stray off on a tangent.

You must ensure participation from everyone. This does not mean you force each child to speak: silent listening has its value; but you must watch out for 'switching off'. Two simple techniques we use are to 'go around' for comments, and to keep track of those who are quiet to direct a question to them occasionally.

Long silences are not only alright, but necessary. Some children need to gather their thoughts and formulate full sentences before they are willing to utter them. Some on the other hand don't mind 'thinking aloud'.

Give enough time for each child to complete their thought. Interruptions are the bane of any dialogue, and beyond a point one cannot completely remove them! Each of us can be sensitised to the fact that the other's thought is not completed.

The language and vocabulary can be simple, at their level, and yet at times it is good to encourage them to articulate clearly, in complete sentences.

It is useful to have a topic or a question in mind so that you can initiate the dialogue, but make sure there is always an opening for a child to bring up something unexpectedly.

Avoid using the dialogue session as a 'scolding' session, or to put across a moral lesson, however subtly. When students sense this, or imagine it, they clam up immediately. One nice quality we notice about this age group is that they are quite open and non-defensive when sitting in dialogue. They invite criticism from each other in this space, perhaps because they feel it is a 'safe' place. So we must not abuse this space.

Never compare students in terms of their contributions to a dialogue, praising one or putting down another.

What do we talk about?

Suitable topics for this age group

Some questions have answers that are known – if you don't know it yourself, you can always find out by asking someone or reading the right book. For other questions, there are no authorities, no books with the correct answers. Children can be asked for examples of such questions, and they usually understand the distinction very well. We have tried using a Question Box, where children can put their written questions, and we pick one at random to discuss each time. At other times, students may come up with their questions at the beginning of class. Some examples of questions the children have asked are: *Why are some people lazy? Do we have to know a lot about animals to care about them? Why do people commit suicide? Why do people who are smaller get bullied more? And this gem: why is it when we are doing something we like doing and someone asks us to do something else which we normally like doing, but now we didn't want to stop doing the first thing, we don't do this other thing as well as we would have done it if we had just done it by itself?!*

Some topics that work well for this age group are: competition, excellence, sexuality, media, poverty, war, responsibility, helpfulness, school issues, relationships and friendship, emotions, why do we always want things to go our way, *anything* with connections to our daily life. The quotes included in this handout are from things the students of CFL wrote about their dialogue sessions.

Three important points to note are:

- We are ready to talk about anything under the sun, at their level
- We as teachers are also thinking about these topics in our own lives
- We often revisit topics

Challenges we face

Over the years we have come across challenging situations in dialogue classes. The way through these challenges will have to be worked out by the individual teacher in his or her situation, so we will just mention the challenges as questions for contemplation...

- When a child is very quiet and shy, how do we help him or her share and partake of the dialogue?
- How do we talk about 'serious' matters without making them heavy and sombre for the young child?
- There is often a big gap between what we say and how we behave! This may seem like an obvious and trivial fact, but it is actually at the heart of many things that we discuss. Children (and we adults) can become wonderfully articulate

about our feelings and tendencies, but remain nevertheless highly resistant to change.

- We often appear to our students to be contradicting our own statements. We can all come up with examples of this kind! The only thing to do is to be vulnerable – and humble. Create an environment where students and teachers can point things out to each other, so that it is not a one-sided business.

In conclusion, please do make space and time for dialogue with your students. It is vital that we keep the channels of communication open with our children at this age.

“We talk about all kinds of things, like responsibility, why we get restless, why we like to watch movies or TV so much. Friendship problems, and if we want to confess or tell out something, and we also talked about sex education a lot. We also talked about things like fear, anger and caring for the people around you.”

“For some time we spoke about competition. Whether we think it’s good to have it in school or not...We spoke about peer pressure. How it makes some people do what they are not ready to or what they don’t want to do...Excellence is also one of the topics we spoke about. We discussed why we need it and why we like to be good in what we do.”

“Why terrorists do what they do, what we feel about child labour and poverty, what we can do about people who are affected, what we would like to be when we grow up...what are some things we can do to help the environment.”

“It is nice to have a class where we can speak our mind and not be bound by the rule of the subject...the teacher becomes almost like another student.”

“We talk about feelings and there is no homework and no textbook and all of us talk about one question.”

“I wouldn’t really call it a class; it’s more like a discussion between people, in other words a very serious chat.”

“Sex and the feelings behind it was also something I enjoyed because it was exciting and other people in the class were hyped about it too. It loosens up the nervousness about talking about sex.”

“In other classes you learn how to solve ‘physical’ problems. Here we learn about ‘mental’ problems. Mental problems are often far more serious than physical problems.”

An example from one of our classes

Dialogue or discussion classes with the Palashas (twelve to thirteen year-olds) took an interesting turn recently. Our librarian told us that the 6 year-old Saralas came to her with the latest Frontline magazine, pointed to its cover and asked her, “What’s happened to this boy?” The picture shows a Lebanese boy in his mother’s arms, badly hurt and scarred. And it started off a train of questioning in our librarian’s mind: Should I leave such disturbing pictures around for little children to notice? What effect do these increasingly explicit scenes in the press have on the children?

We decided to bring our concerns to the Palashas. Their responses were truly an eye-opener for us, and deeply moving. What follows is a summary of their own thoughts and feelings on the question, which broadened considerably in discussion as you will see.

It is important for children to know what is going on in the world – even if it is bad news. That is the only way for us to be ‘in the world’. But very small children also need to believe that the world is a good place; they need to feel safe. When they are six years old, we should start letting them know about the sad or bad parts of life. We can’t start with far away events in places like Israel, but with problems in their own neighbourhood, like poor people or sick people or accidents.

Adults and older children must talk to younger ones about these things a lot, so that they don’t get the ‘wrong idea’, so that they don’t get a black-and-white idea of life. We remember (it was only a few years ago!) the day we realized that the world has problems; we remember how it felt, and how fear came into our thoughts. Is that how the Buddha felt when he first saw suffering, though at a much older age?

Pictures of suffering are important because then you realize how bad it really is – pictures prove that the suffering is real. But sometimes journalists take pictures that make you feel sick. Why do they do that – to become famous, or to sell more copies and become rich? Sometimes, but not always, we can make out when a picture was taken with a good intention or a bad one.

We asked the Palashas: Of what benefit is this knowledge of the world? Does knowing about things make us more sensitive, more compassionate? Or does it do the opposite; do we become more insensitive because of constant exposure to stories and pictures of others’ suffering?

“Yes, the way TV shows these stories is horrible. First they show scenes of war and people hurt or dead, then suddenly there is an advertisement to buy a car, then again the stories continue. It feels sick to watch in this way. How can the TV people feel anything if they can do this?”

Also, small children nowadays are playing video and computer games (and watching cartoons) that are as bad as the news. And in those games people are being killed all over the place – many times children don’t know the difference between a game or a movie and the real news! So it does make us insensitive that way. Why are parents letting their kids play these games?”

Dialogue with Young Adults

I will begin with a brief description of how we experience young adults.

Young adults from the age 16 -19 seem ideally poised for many aspects of learning. They are capable of and seem ready for abstraction. That is, they are capable of moving from a particular example to a more general principle. They are also better able to articulate many of their questions and concerns. These questions concern both what is happening in the world around them and also their own psychological and emotional landscapes.

Emotionally there is a certain maturation that seems to take place. However, they are also subject to mood swings and a fair amount of emotional churning. Often adults are not privy to this process.

Physically they are capable of many challenges and have tremendous energy. Sexuality and issues surrounding sexuality also play an important role in their lives. Again we notice that it is no longer openly visible as in the case pre-adolescent or adolescent children.

A student at this age is struggling with the whole issue of her identity and her role in the world. Issues such as: What are my interests? How will I fit into the world? What will I do in the future? What do people think of me? are of great importance. They are also beginning to deal with issues such as the individual and society and are ready to respond to the various crises facing the world: environmental, social and personal.

Peer group interaction and peer dynamics continue to dominate their lives. The opinion that matters the most in matters of self-identity, choice of clothes, world view, taste in music etc is the opinion of one’s peers. This is because they have a strong feeling that peers understand their world and what they are going through and the adults do not. Very often, since they all come from more or less the same

socio-economic and cultural backgrounds, this process only helps strengthen and sustain their world views. One of the more serious aspects of peer interaction is that it allows many young people to live in a bubble and escape from their daily life and the reality of its demands.

The media also has a tremendous hold on young adults. Often subliminally and sometimes crudely the media shapes and conditions their minds. The media often seems to convey that there is a lifestyle out there which is glamorous and exciting that we should all aspire towards achieving. The ordinary daily life that we all lead in contrast is made to appear drab and boring. The media and the peer group conspire together to sustain this world.

What we hope to achieve in a dialogue with young adults

I would like to begin by stating that this is not a group therapy or individual therapy session, nor is it a place for moralising or a 'moral science' class. Further, we are not looking to solve any particular problem and reach a conclusion.

Dialogue sessions are times when we together think and share our thoughts about various aspects of life. We very often question these things, such as images of people, situations and even our own identity, all of which seem very real to us. We most often let our emotions, thoughts, opinions and ideas overwhelm us. We take all these feelings for granted and let them pass away saying, "It is only natural." Questioning them is very often painful, so these views we hold so close remain unquestioned. Dialogue sessions are times when we question these feelings; not specific incidents but from a more general perspective. The discussions give rise to new questions, which we think about through the week.

Our primary intention is to create a space where there is open and free communication between children and adults, a space that is safe for children and adults to share their thoughts, feelings and opinions free of fear and judgement.

In the dialogue sessions we hope to help young adults to gain a certain perspective on many of the issues and difficulties they are going through. We would like to help them have a certain detachment from the issue at hand and a capacity to look at it from various points of view.

The dialogue session is space for self-learning and enquiry. We hope that in the process of dialogue there is sharing of meaning and understanding and perhaps even an insight into the nature of our psychological being. We hope this process helps dissolve emotional knots and conflicts that we humans seem constantly getting into. We would like young adults to realise that each one of us has an inner world which consists of emotions, thoughts and feelings, and that society and the world out there mirrors this inner world.

The right environment for dialogue to take place

What is the right environment for dialogue to take place?

First and foremost we need to establish a relationship of trust between the adults and the young adults participating in the dialogue. We would like to emphasise that for us, having meaningful dialogues with young people is an integral part of our education and is extremely important for us. Children begin these dialogue sessions at CFL when they are in Middle School. These dialogues occur not only during the formal dialogue session, but also in many informal settings.

A stable peer group helps the dialogue sessions flow smoothly. When each participant is not worried about what the other person is thinking about them and whether what they say will be held and used against them, there can be a genuine sense of enquiry.

It is very important that the adults who play the role of the facilitators do not come in with their own agenda. This is not a space to foist one's ideology or dogma. This requires that adults are open to being questioned, in fact constantly invite questions. The adults need to start from where the participants are, and not from a preconceived notion of where they are or where they should be. The adult should be capable of listening and allow for long pauses before young people feel free to come in and speak. They should be careful not to dominate the session, talking to each other rather than with the participants.

"I have enjoyed talking about things like—what is the self, when do we get hurt and so on. These are mostly the ups and downs in my life, and so I feel very connected to them. Why do we get hurt? Something like this is so basic; everyone gets hurt. However, when we started looking at why it happens, and when it happens, I realised how baffling the whole thing actually was!"

Difficulties and challenges in creating a dialogue session

As we have mentioned before, creating an environment with free and open communication between adults and children is extremely important for us. However, this is by no means an easy task. In particular dialogue sessions often face many challenges. We discuss a few.

- On a given day the topic being discussed may just not take off. Participants may feel that the topic is not relevant to their life and switch off
- One or two participants may be simply not in the mood and this can affect the whole session

- Some of the discussions may be too close to the hearts of participants and they may be unable to be vulnerable and open
- Dialogue sessions can often be punctuated with long silence and the facilitators must not feel anxious to try and fill this space
- Young adults may feel that they have to come up with a profound or complete answer and may feel shy or reluctant to share their not yet fully thought out ideas
- If an adult is too quick to intervene or correct a particular opinion that a student has, then they may hesitate to open up the next time
- Some young adults may feel suspicious of the process of discussing these issues and may feel that it is pointless talking about them
- Dialogue sessions can often unleash strong emotions such as fear, anger and frustration

“I don’t feel it is easy to participate in dialogue sessions. A lot of effort has to be put into actually thinking about the problem at hand... Some people are shy and prefer not to speak out, and some people would rather switch off and think about something that does not require effort.”

Conclusion

We have shared with you some of our observations and learning over the years about dialogue sessions. It is perhaps obvious by now that there is no blueprint to engage in this process. By its very definition, each session is unique and unpredictable. This fact offers the participants tremendous possibilities to experiment with dialogue in their own environments.

Art in CFL

Radhika Neelakantan

It is not the language of painters but the language of nature which one should listen to, the feeling for the things themselves, for reality, is more important than the feeling for pictures. –**Vincent Van Gogh**

Importance of art in a child's education

It is fun. It lends a natural sensitivity towards aesthetic sensibility. It allows the child to play with line, form and colour. Unlike abstract activities, it provides immediate gratification and is immediately meaningful to a child. It nurtures the exploratory and creative experience through handling material. It allows the child to relate to the world around. It is an opportunity that nurtures the child's ability to engage creatively in the present.

Art is a way of depicting what one sees of the universe in different ways. It is amazing that you can make completely realistic or totally symbolic art and it tells something in a new light. Sometimes art helps you to look at things in a way you have never looked at before.

The place of art is to look at or see the world around us.

Art is an important mode of expression. The artist may not consciously be trying to express herself, but it is an act of expression all the same. It seems to be, like music, 'non linear'. Hence, it is an important area for exploration. Of course there is the possibility of encountering (and expressing) at many levels - at the 'simple' level of colour, form and technique, as well as multiple levels of meaning.

Place of art in the CFL curriculum

Opportunities are provided for students to explore art. There is the space for those for whom it may become a passion.

Is it possible to work with attention? Is it possible to look carefully and seriously at what one is doing? Is it possible to begin, go through a process and end it with energy? This is the approach and there is interest in seeing what happens with children of all ages. In order to observe and understand what is happening with the child, it is important to relate to and be alert to the child and the situation. In the case of art especially, it is important that the adult is more of an observer and intervenes only when absolutely necessary.

The group of teachers working at CFL have a healthy attitude towards art. This is important. If as a group it is possible to discuss issues openly, then a more wholesome curriculum may result.

Approach to designing the art curriculum in CFL and some questions

When I began to do art with children in CFL, I began with activities, activities that were fun and those that interested the children during the art class. Slowly over the years, it has become important to see if the child can learn to observe lines, forms, shapes and colour in the environment. Looking and drawing has become a very important part of the curriculum. The final artwork is unique and beautiful in its own way when there is observation.

Is it possible for the child to be alert to what is going on within and outside and the relationship between the two? Can the child experience the joy of working seriously and explore the nuances that this area provides at his or her own level? Is it possible to be non-judgmental and non-restrictive? Or can there be tentativeness to judgment?

Group feedback occurs more or less once a week. At the end of a session, all the artwork is put out on the floor and the whole group walks around commenting on their own as well as others' work. It is a serious activity and a whole lot of listening happens at this time. Most children are careful about what they say but are truthful. Also, this is a time for a lot of learning from each other.

Relationship to art

Interest in art has provided enough material to go on. Ideas appear as each activity is done and these are improved upon over time. There is therefore a flexible curriculum or method. It is the active involvement with children that allows for ideas to spring forth.

The activities are simple in themselves. It is important to introduce the activity to the group at the right time. Art is not restricted to any particular medium or form. It is really a very broad structure that we work with.

Art curriculum

Discussions with children play an important part in forming the art curriculum in CFL. Exploration of different activities allows for exposure to the various possibilities for the child and the adult.

The same exercises can be done with different age groups. The instructions may be the same but how different children in different age groups perceive and work is vastly different. From this, ideas are born for the next class.

Junior school (6-10yrs)

At this age, children, left to themselves, are usually happy to draw for long periods of time without being aware of time and what is going on around them.

Free drawing is something that is encouraged. This is not part of an “art” class but would be across the timetable. Flat, bold and direct representations are common, slowly moving on to more sophisticated details. Looking and drawing begins when they go out of the classroom and draw things they have observed in their nature journals.

Middle school (11-14yrs)

Art classes are done formally in the art room. This is an exciting transition for the child and they are open to suggestions. It is at this time that art room “etiquette” is taught and emphasized upon each time the art class begins. It is an important activity and time spent on this is well spent. The maintenance of the art room and art materials needs constant discussions.

Soon, it is quite clear that some of the children have learnt the do’s and don’ts and some haven’t. Some never will! The understanding of the concept of responsibility is important. Sometimes everything is laid out for a class and sometimes they are expected to take what they require, use and then put back neatly what they use. Time needs to be managed for them at this stage and given sufficient time, cleaning up is done well.

Through this age, they begin to expect more of themselves as artists. Quick work is done and if they are dissatisfied, there is a loss of interest in their work. Artwork seen elsewhere is copied and there seems to be a loss of “faith” in themselves. Sometimes there is a tendency to draw things as they know them rather than how they see them. There is however a willingness to share and interact with their peers. This can be used to advantage. Group activities can be done, and through this, organizational and creative atmospheres are created. For example, in the making of a collage, discussions often take the group through situations of understanding and conflict.

Some exposure to other artists’ works in the form of readings from the open library and looking at works of artists who happen to visit the school or are at school is done. Art is also done when other subjects or projects are done.

Children are ready to improve their technical skills and have more control over the media. There is a readiness to rework problem areas and a greater awareness of detail, as they grow older.

Senior school (14-18yrs)

Coming to the senior school allows students to choose the activity they will work on for the term. This allows them to work on something they would really like to explore. So, at this stage, there is a seriousness to work at something in a

sustained manner. Here, students are able to work for longer times on their own and are ready to look at their work more critically.

More serious reading is suggested regarding art and emphasis is given to preparatory work.

Role of parents

Parents can play an important role in the child's development. At an early age, children should be provided with sufficient material to explore the possibilities. It is important that children are not taught to draw something in a particular way. Also art need not be offered as an activity if there is nothing else to do or if the child is 'bored'. That is another whole long discussion!

Some of the challenges

As adults, each of us has our own ideas about how things are taught. Is it possible to hold these ideas lightly and look at things afresh? Is it possible also to see how traditional art evolved and not reject those ideas all together? Apart from that, art teachers, like all other teachers, feel that sufficient time is not give to their subject. Is it possible to work out allocation of time and give at least three hours a week to art? This would be satisfactory for the child to get a feel of the subject and to begin to bloom!

Some art activities and projects done over the years

1. 10 min sketch: On entering the art room, a 10 min sketch is done. Any natural or man-made object is chosen by the child or if asked, by the adult. Use a 5B or 6B pencil, a 4"x 6" sheet of paper. It is important to stress that drawings be made to fit the whole sheet of paper and if necessary to exceed the paper! Older students who are seriously pursuing art may be asked to do a ten-minute sketch everyday.

2. Portraits: This is an activity that may extend over some weeks.

Day 1: Each child is asked to choose a partner (much debate can ensue and therefore, it may be better for half of them to pick the names of the other half!) and is asked to draw the head and neck of the person they know so well without looking at them. They work slowly and carefully, trying to remember whatever details they can.

Day 2: This time they sit in front of their partners and draw, looking at their partner. (Students are encouraged to take their time and not rush to finish. If there is time, they exchange roles and the artist becomes the model. Otherwise it can be done the next day.) This activity can be done first without looking at the paper and then looking at the paper. A4 size paper is used. The drawing covers the sheet.

Day 3: The teacher demonstrates how it could be done. Looking at a subject, with all the children watching, the teacher sketches with commentaries on what to look at and how to keep the line tentative. They are asked to look at the lines and the difference in the brightness. Emphasis should be made to keep in mind that they must draw as they see and not as they know something to be.

Day 4: The students work on their own. They go back to their partner and repeat the exercise.

Day 5 onwards: People from the school or outside are asked to sit for the group.

No time period is set in which students have to complete a portrait. It is limited by how long the partner has the patience to sit!

3. Collage: It can take off from where the portrait ended or a new drawing can be made. Sketches from nature make excellent material for this activity. A small part of this can be enlarged and two or three children can work on a collage.

A 'paint box' with pieces of paper in various colours is made. Fevicol mixed with water (1:1) is then spread on the section of the drawing that needs to be of that colour and the pieces of paper are stuck onto the drawing. As this activity extends over some days, children put away the pieces of paper they have torn into paper envelopes, to be used again. Some of them would have gone to great trouble to get the exact colours they need!

4. Individual ideas: After a few weeks of ordered activities, it is a pleasant exercise for the students to do anything that they would like to do. The teacher can make suggestions if the student asks for some. We used chart paper of good quality and a size slightly larger than A2 for painting. Sometimes this work has also extended over a few weeks.

5. Mural of the flora around the campus: This is a project that extended over a few months.

a. Students were asked to go out and sketch from nature. (If such environments are not accessible, they can draw potted plants.) A4 size sheets were used at this stage.

b. Little windows of size 4cm x 6cm were cut into cardboard. These windows were then moved over the sketches that had been done to identify the part they would like to enlarge. The window was drawn on the sketch and a 4cm x 6cm grid was drawn very lightly (each line 1cm from the other) on the sketch after colouring the window.

c. Whatever was in the window was enlarged using a grid. This grid was drawn very lightly on an A2 size paper. 4 x 6 lines. These lines were rubbed off

later after the picture had been enlarged. These pictures were then painted using poster colours.

d. A template of the wall taking into consideration the windows and doors was made. One inch on the wall was represented by 1cm on the chart paper. Each child in consultation with the teacher then drew the chosen drawing on the template. To do this in consultation with the teacher is important, as the teacher would find it easier to have an overall idea about things to take shape; the bigger picture!

e. From the template, the drawing was enlarged onto the wall using a pencil. Each student did this. The proportions are important and need to be kept in mind here.

f. The painting then began. Acrylic paint was used. Students made a list of the colours they were likely to need and then a comprehensive list of colours was made. (It is important to talk to the students about the effect of gravity on paint-loaded brushes when vertical walls are touched.) Water was mixed with the acrylic paint when necessary. For palettes and water containers we asked students to bring plastic containers and lids that they wanted to discard. Ladders would be a requirement.



Craft: The Art of Working with Materials

Lalitha Manjunath

Introduction

This document is an attempt to share my experience and expertise with all those people who are interested, curious and enjoy working with their hands. This engagement has largely happened in the sharing with many groups of children.

An effort in documenting these activities has been done in the following pages. It is also to assure all those people who are enthused, to take on their passion without feeling the lack a professional background.

Apart from a four month intense course in clay work, all my learning and growth has happened on my own and in innumerable sessions with children. Much of the work documented here has to do with clay.

Intention

Children have a strong urge to work with their hands. At Centre for Learning, it is our intention to nurture this innate quality of the child.

The teacher here has an important role in motivating the student with respect to their being open and flexible. The teacher begins by looking at the child's capability and perception.

Through the years the students are exposed and encouraged to work with different materials. One of the conditions of achieving the full potential of every child is through a sustained programme of engagement with materials and equipment. Children create and design tangible objects using materials like

fabric, thread, clay, paper, bamboo, coconut shell, beads etc. This has helped them to learn the nature and beauty as well as the limitations of each of these.

The most difficult task of education is to keep this perception open and to help children develop both sensitivity and selectivity.

Children tend to replicate what they consider as a "perfect craft piece", without experiencing the process involved in making something. The craft curriculum in CFL emphasizes the importance of the process involved rather than arriving at the end result.

Process

As the children to make craft items, which have an ornamental or utility value, they also learn to bring aesthetics and quality to their work.

The process of understanding any material is an interesting aspect in itself. One

learns this by being willing to try (making mistakes along the way!) and by being patient.

The teacher offers suggestions and stimulates and motivates the child to seek new solutions. As the child works over the years, a certain growth and expertise in their quality of work becomes evident.

It has been recognized that teamwork in creating an art piece is an important aspect in learning, apart from individual engagement. Qualities such as co-operating, brainstorming together, helping one another and assessing work are woven together when activities are planned with a group of 10 to 15 students.

Pure joy is the children's joy. They have the power of using any and every trivial thing to create their world of interest and the ugliest doll is made beautiful with their imagination and lives. **Rabindranath Tagore**

Structure

- The curriculum begins when the child joins the primary section at the age of six
- This exploration goes on up to the age of fourteen years. This is spread over two block periods of an hour and a half each in a week.
- In the senior school, students above the age of fifteen choose any one activity in which they work, to a large degree, independently
- Every class begins with a meeting to discuss and organize the time and tasks involved
- The approach to an idea or a design and the visualization of details is given importance, rather than immediately getting into skills and techniques
- Extension projects are given when the students are around twelve years old
- Students are made aware of the care and maintenance of tools and of the importance of cleaning the work area after their work is completed
- The craft lab is open throughout the day to encourage easy access for adults and students

Clay work

Level 6 to 8 years

First four to six weeks: Activities/Assignments

1. Familiarity with the lab and the equipment for every new group which begins to work
2. A few sessions of free, open ended work with minimal adult intervention
3. Sharing of ideas among the students to motivate each other
4. Preparation of clay to know the whole process
5. Introduction of techniques using their ideas
6. Teaching the techniques of joining surfaces
7. Use of tools for functional and decorative purposes

Discussion points

1. What is clay, its origin?
2. Where does it come from?
3. Properties of clay
4. Demonstration of the firing process
5. Why does one fire clay objects?
6. Difference between a raw and a fired clay object with respect to colour, texture, strength and usability
7. Why does fired clay sometimes become damaged and cracked?

After 8 weeks: Activities/Assignments

1. Introduce forms with themes such as animals, plants, vehicles; imaginary, human and inanimate forms
2. Introduce the three basic techniques in clay work – pinching, coiling and slab work
3. Encourage children to make objects using any of these techniques
4. Enlarge an idea using a technique. Using slabs one can make tiles, boxes, mirror frames, trays, sculptures, pen holders, name and number plate etc.
5. Explore activities such as mixing different clays, clay with sand, clay with ash, clay with sawdust, clay with paper etc.
6. Use occasions like *Ganesh Chaturthi*, *Dusseera*, *Diwali* to create forms like *Ganesha* dolls, *diyas* etc.

Discussion points

1. Testing if a piece remains intact after drying.
2. How to repair damage?
3. Re-do something which has failed
4. Share any discoveries found by anybody
5. What do textures mean and how does one get those effects on clay?

Level 8 to 11 years: Activities/Assignments

1. Use of techniques of coiling, pinching, and slab making for creating objects

Ideas / Themes

Useful items around the house

1. Pens, spoon holders
2. Mirror frames
3. Key holders
4. Letter holders
5. Boxes, with or without lids

Ornamental / decorative purpose

1. Suspending / hanging mobiles
2. Beads and jewellery
3. Wall hangers
4. Tiles for sticking on the walls
5. Masks

Sculpture

1. Humans – only head with the details
2. Plants, animals and vehicles, using the same idea as above

Discussion points

1. Polishing on surfaces; differences
2. Using different techniques to polish
3. Elaboration on a theme to visualize possibilities
4. Why does one wedge clay? Reasons and uses
5. To be critical about one's work and learn from mistakes; to repeat or redo an idea.

Level 12 to 15 years: Activities/Assignments

1. Introduce techniques of wheel work
 - (i) To center and make a cylinder with the clay
 - (ii) Start with forms like :
 - Paper weight
 - Candle Holders
 - (iii) Next move to forms like
 - Holders
 - Mugs, cups
 - Pots
 - Attachments like handle, spout, lid etc.
2. Sculpture—an enlarged version using coil or slab techniques
3. Huge multi-pieced masks
4. Big hand-built pots
5. Combine two or three materials to design a piece. For example: a clay pot with coconut shell lid.
6. Wall murals, tiling and mosaic work
7. Basic glazing around the age of 15 years

Discussion points

1. Precision in the work
2. Quality and aesthetics to be discussed and woven into the design
3. Big design project should proceed only after discussing, drawing and then detailing the clay work.
4. Arriving at different shades while firing
5. Details of firing process
6. Discuss what glazing means and learn the basic chemistry behind it
7. Rectify mistakes and learn to redo work.

Basic requirements

1. Raw dry clay from the local lakes or from local potters
2. Big tubs or cement tanks for soaking and storing the clay
3. Framed mesh/sieve with different grades
4. Rolling pins, flat sticks, wooden planks or boards
5. Small cups/bowls, sponge, gunny sack

6. Shelf or a rack for storing the finished work
7. Plaster bats for hardening the slurry
8. Odd bits of tools made from broken things: empty pen refill, tooth brush, pen cap, tongue cleaner etc.
9. Sharpened hack-saw blades
10. Low cost tyre wheel and decorating wheel
11. Plastic covers for storing clay

Firing red / terra cotta clay

- Finished clay objects, once dry after a week or 10 days, are ready for firing
- The kiln could be built with country bricks and plastered with mud
- The square, rectangular or circular kiln has a wall a foot above the ground
- This has an opening for feeding the fire
- Above this wall, steel rods need to be placed to make a grater
- After keeping the rods, one continues to extend the wall keeping a certain height required for the load of clay objects
- Before firing, the grater has to be roughly covered with broken clay pots or shards. This helps in keeping the clay objects on the grater. Also it allows the heat to pass through the shards before it reaches the raw clay objects
- Bigger sized objects have to be placed first
- Wheel forms also could be placed close to the fire
- After loading the kiln, the mouth is covered with clay tiles and with a thick layer of grass to cover the gaps. Space in the center is to be provided for the smoke to pass through
- The gaps have to be plastered with mud

Firing time

- The first two hours of firing is very slow and outside the mouth of the kiln
- This is very crucial as otherwise the pots might be damaged
- After two hours the logs are gradually inched forward. Allow 15 minutes before pushing the fire each time into the kiln
- Between the third and the fourth hour, the fire could be close to the centre of the kiln
- After the fourth hour, firing can be rapid and continuous
- By the end of the fifth hour, the fire would have reached the top, giving a

delightful red glow, a feast for the potters, during each firing

- The mouth of kiln has to be covered with bricks at the end of the firing
- Twenty hours gap has to be given before the kiln is opened

Black / smoke firing

A potter can get a rich, permanent, natural, black glaze on the pots by following this method:

- The pieces have to be put into a large pot
- Fill the pot with sawdust, cow dung or dry leaves
- Cover the mouth of the pot with grass. Seal the grass with mud or clay
- Place this pot in the kiln with the other clay objects
- One could even get a whole batch of clay objects black, by covering the chimney. At the end of the usual firing, one needs to stuff the fire mouth and fire chamber completely with grass. After doing this for about 15 minutes, the mouth of the fire chamber has to be sealed. This makes all the objects in the kiln acquire a permanent black glaze.

Contacts for workshops and consultations

1. Raw clay – Local potter, ceramic manufactures and Pottery Town for prepared clay (only in Bangalore).
2. Regional Technical, Training and Development Centre Victoria Road, (Next to Life Style) Bangalore. Ph: 25554969 (Off.) Contact: Mr. Ullaskar De (Pottery Department) and Mr. Jayaram This center offers training and work shops in building kilns.
3. Mr. Sanjay Manchekar – Expert Studio Potter in Kilns and glazes Ph : 09322332228 (Mobile)
4. This contact is for holding workshops in art and craft and for expert consultation. Ms Vishakha Chanchani, Good Earth, Uttarahalli Road, Kengeri, Bangalore – 560 060.
5. Lalita Manjunath, 16 Good Earth, Uttarahalli Road, Kengeri, Bangalore – 560 060, E-mail : lalita.manjunath@gmail.com

Contact for students to do pottery as a career

1. Gramadoya Sangh
P.O. Bhadrawati
Dist. Chandrapur – 442 902
State – Maharashtra
(A social work organization to promote rural pottery and potters)
2. The Andretta Pottery and Craft Society
V.P.O. Andretta
Dist. Kangra – 176 103
Himachal Pradesh
E-mail : minimarv_99@yahoo.co.uk
www.andrettapottery.com

The Mosaic Activity (A group/team work)

This is an interesting activity appropriate for a group. This activity is suitable for children above the age of twelve years. The activity facilitates group decision-making, co-operation and a critical appreciation of each others' quality of work. It was done with a group of fifteen students for three hours a week. Some students finished in eight weeks and some went on for ten weeks.

This is how the whole activity was envisaged:

1. The group assembled in front of the wall on which the mosaic work had to be done.
2. The actual size with some dimensions was finalized by the group
3. The place/area for each person was marked with a wet chalk and scale. They decided that the height and length would be 42cm and the width would be 37 cm
4. Some deliberation happened to decide on the theme to bring in some connectedness. The idea for the design was 'patterns from nature'
5. Two sessions went into drawing and arriving at the final draft on paper using the actual dimensions on the wall
6. The children tried painting, using water colours, which were to be used finally with the tiles
7. The drawing was transferred on to the wall with a wet chalk
8. After breaking the tiles maintaining a certain size, the sticking with tile cement/

adhesive started

9. Each time, the wall had to be wetted before sticking the pieces

10. After sticking all the pieces, grouting between the tiles had to be done to cover the gaps

The whole activity had very little guidance from the teacher. The group gave feedback to each other. They also organized the materials needed for the work.

It was a pleasure to see the designs unfold on the wall.

The teacher obtained the glazed tiles, cement and grouting material from the ceramic and hardware dealers.

Bamboo

Children around the age of nine or ten begin to become more confident about using different materials, equipments and tools. Quite often, boys tend to enjoy using tools like a hammer, knife and hacksaw. This is the stage when activities like carpentry and bamboo work should be introduced.

Bamboo has enormous possibilities. As a material it has great aesthetic quality and it is fairly easy to understand its nature. Right from traditional basket weaving which is quite complex (though it looks simple) to making a pendent or a key chain, one can bring in a great deal of craftsmanship.

Basic exercises

Learn to use the knife and hammer

Split the bamboo into flat and round strips

Sandpaper finely to see the grain of the bamboo clearly

Make designs with the hot rod/poker.

After doing these things with the bamboo, one can make:

1. hanging decorative mobiles.
2. Mikado sticks
3. chopsticks
4. pendants
5. key chains, book marks
6. earrings
7. bangles
8. toys

After a few weeks of working, students become fairly confident with the material. At this stage one could encourage them to come up with their own ideas and designs.

Extension exercises

1. holders for stationery items keys and knives
2. mirror frames
3. delicate toys
4. weaving Baskets

One could even invite a traditional basket weaver for a workshop.

Equipment

Good bamboo from the wholesale market
Knives with strong handles
Iron Poker
Stove
Hammer, nails, hooks
Hacksaw, spare blades
Sandpaper of two-three grades
Hand drill and drill bits

Reference

Bamboo and Cane Craft of North-East India, by Rajan M.D., Nilam Iyer and Gnanashyam Pandya
Published by National Institute of Design

Contact for workshops:

C.D. Sunish
URAOU
Thrikkaipetta P.O., Wayanad District
Kerala State
E-mail : uravu2001@yahoo.com
Phone : 914936231400 / 326896

Creation is one of the most difficult things to understand. The man who writes a poem, however beautiful, thinks he is a creative being. The man and the women who breed children think that they are creative. The man or the cook who makes bread thinks, perhaps, he is also creative. But creation is something far more. That man is not creative, who merely writes a book or fulfils himself in some petty little ambition. Creation is not a man-made structure, or man-made technological knowledge and the result of technological knowledge which is merely invention. Creation is something that is timeless, that has no tomorrow and yesterday; it is: living timelessly. And you come to it very naturally if you understand this whole problem of existence.

I do not know if you have every noticed how a drum is always empty. When you strike on it, it gives the right tone; but it is empty. Our minds are never empty; they are always full. Therefore, our action is always from this dreadful noise of thought, of memory, of despair; and therefore action is always contradictory, leading to great misery.

But a mind that is completely empty, empty in the sense of observation, silence and therefore, love and the whole understanding of death—such a mind is creative. And a creative mind is empty all the time; it acts from that emptiness, it speaks from that emptiness. And, therefore, it will always be true, it will never bring about a deception within itself. And it is only such a religious mind that can solve the problems of misery in this world.

**Extracted from J Krishnamurti
Madras 7th Public Talk 6th January 1965**

Role of the Body in Learning

Stefi Barna

The goal of this workshop is to experiment with what kinds of things can be learned using some capacities of our bodies and senses. The workshop consists of a series of experiences to cultivate our 'physical intelligences'. Some of them may be of use with students, or simply meaningful for you and of no use in the classroom whatsoever!

What do we mean by the 'body'? Body and mind are not really separate. But since schooling prioritises ideas/thinking over all other kinds of learning, and schooling ignores (is uncomfortable with) the physical body and the senses, we will focus today on physical side of the mind/body unit. How is the body 'of use' in education? It is the vehicle for learning, awakens dormant faculties, keeps the brain elastic. Newness is important, not mastery. After using the body you are in a different state of mind, have a more perceptive inner environment

Society creates the bodies it needs. Schools are intellectual enterprises, dominated by technology and thinking to the exclusion of everything else. Children become alienated from the body/senses and lose the ability to perceive their relatedness to the world around us. The body is the instrument through which we experience the world.

Urban school children in general are characterised by:

- Low levels of fitness (flexibility, stamina, strength)
- Relatively low energy through the day
- Emphasis on appearance versus ability
- Increasing obesity
- Urban orientation to life
- Generally 'dis-embodied' experiences

What is wrong with PT as it is practised currently?

1. In our sedentary lives, a special time is set aside to move, rather than daily movement being a part of life. This is called Physical Education. PE/PT, like academics, focuses on a narrow range of abilities, i.e., the skills for competitive team sports. These are standardised internationally and discourage less-skilled students.

2. PE/PT does not prepare young people for a physically active and alive adulthood.

3. In schools, physical learning competes with academic learning for time.

4. Teachers rely on communication about exercise as a value (“it’s good to be fit”) rather than as role modelling it as a way of life. We tend to take a moralistic approach rather than sharing our own authentic joy and pleasure about it (mostly because we have lost it ourselves!). Adults avoid taking activity when they are tired or feel self-conscious, which sends the message that movement requires optimal conditions of energy/interest. Yet movement can take place in any kind of mood, not only in opposition to couch-potato-hood.

What is Physical Activity good for?

- Affords general fitness for an otherwise sedentary life
- To prepare the body so that the mind can study
- To develop different ways of physical ‘intelligence’

Body Awareness Exercise

- sit straight, comfortable, relaxed, centre your weight, close your eyes when you can
- notice how you are feeling: tired, full, heavy, agitated, anxious, preoccupied
- don’t try to change anything, just make note of it
- notice tensions or discomforts in different parts of your body
- check all parts of your human frame: feet/hands, face, neck, back of head
- notice where you feel ease or comfort
- watch the depth of your breath, take a deep breath to compare: ribs, chest, belly
- watch the pace of your breath
- find the beating of your heart – watch it, is it fast or slow, solid or butterfly?
- where do feel your pulse, only heart or also elsewhere?
- can you observe both your heart and the full process of breathing? Keep track of both
- notice any sounds in the room
- notice the sounds outside the room
- can you listen to the sounds in and outside the room and also feel your heart and breath?
- now notice your state of mind and how your body feels. Is it the same as when started?
- when you are ready slightly open your eyes, keep them downward looking
- notice the effect of visual stimulus
- whatever you are feeling, whether you are relaxed or uncomfortable or alert

or half-asleep, let the mood or mental state linger on as you go into the next activity. Don't push yourself back into a verbal/visual mode, just come along and bring your current state of mind with you.

Listen to these instructions before you move. Stand up very slowly, with as much economy of movement as you can, be as efficient as you can, and pay attention to each part of the movement of standing up. Don't use your weight to throw you from one position to the next, just watch the use of muscles and joints and where weight is placed.

Drama

Vijay Padaki

The drama workshop at the conference drew the group into the theme through an unusual and insightful approach: the place of co-operation in theatre activities. Participants were required to adopt interesting strategies in completing their exercises and activities. There was also a component on movement in theatre as well as a general discussion on the place of theatre in education. We regret that we are unable to document this insightful workshop for the purpose of this book.



The Open Library

Usha Mukunda and Sunila Rau

(The following is an extract from a larger document detailing the experience of the Open Library at CFL. The document is being prepared for publication in the near future. Interested individuals can write to info@cfl.in with 'open library' in the subject box).

Introduction

At Centre for Learning, we have an open library both in concept and reality. This means that there is free and open access to all material and resources, at all times of day and night, and throughout the year. Mutual trust and shared responsibility provide the ground from which this library functions. The rules and conventions of library interaction evolve out of a sense of co-operation, consideration and care for the community as a whole.

The challenge for the librarian is not one of policing and monitoring, but of perceiving and holding the library and its users as a vibrant functioning whole. This can only be done when the community of users feels a sense of ownership and accountability. For example, on an afternoon when there is a sudden deluge of rain, a couple of students dash to the library to shut windows and move books out of reach of the rain. At night, the place is locked by individual senior students on a rota basis. If one of them is unwell or away, another student takes on that job. Much of this happens without the intervention or knowledge of the librarian.

The collection in this library reflects the commitment to quality and excellence. Classics, both traditional and contemporary, can be found on the shelves. Staff and students are actively involved in the selection process. In fact, students are taken regularly to book stores and book exhibitions to select and buy books for the library. An innovative in-house computer program ensures that all users can borrow, return, search for, reserve and conduct other library operations with ease. The facility of borrowing has been extended to former students, parents and guests.

The main library is located in a beautiful building which was designed with ideas from staff, students and, of course, the architects. Its ambience and aesthetics welcomes and invites all users and visitors. Every student group has a weekly library period which is used for browsing, borrowing, returning and also for various activities to enhance reading and awareness of the library. Helping the library in various ways is an inherent culture of the place. Books in need of repair are restored imaginatively and lovingly by students.

Students also do projects to facilitate use of the library such as creating

bibliographies, making indexes and labels for shelves, posters and book marks, putting together a short video on the library and a brief computer guide for newcomers.

The open library at CFL is a happy and lively place.

The spirit of the open library

How does it come alive in every facet of the school library??

Let's find out! Remember that the openness of the library cannot happen if you are a speed fiend! Space and leisure are essential to the spirit and fulfillment of an open library.

1. Location: Even if you are already in a fixed location, read on for future reference.

The library needs to be in a central place, open and easily accessible to all users. Should it be close to the classrooms? Ask teachers and students what they feel. Not near the kitchen, the street or even the playgrounds for fear of noise, pollution, heat and smoke. Upstairs, downstairs or in the principal's chamber? Again, users' feedback will be valuable.

2. Physical Appearance: Inviting, welcoming, bright, colourful. Remember, this is a library being used mainly by young people. In fact, they can help bring in each of these aspects.

A wide entrance so your users don't feel cramped as they enter. Even if your area is small, try to provide different spaces for different activities. Have furniture or not(!) in tune with the area. For example, relaxing seats and cushions for the informal reading area, table and chairs for reference area, mats for story time and other group activities, little nooks and corners for individual readers, low chairs near shelves for browsing, stone benches for outside reading, a pick-a-book box for anyone to read in the library and so on.

Children will happily make posters listing various aspects of the library. They share their writings, sketches, projects, craft work, flower arrangements and calendars through displays. Notice boards are also not the librarian's prerogative but a joint responsibility. So teachers and students bring in interesting clippings, announcements of exhibitions, pictures and photographs, jokes and cartoons for the librarian to arrange on the notice board. Younger children appreciate it if their material is at their eye level.

There are also 'talking points' A peace flag from Italy, some stones from Lothal, a scrap book of a Mela, assorted things made by Arvind Gupta when he visited.... Each of these has some significance for the children and they can talk

about it to visitors or new entrants.

3. Selection and Collection: It is best that the librarian is on the selection committee, if she is not there already! This is obviously because she is the one who knows the collection, the users and their profiles.

Decide on a budget looking at previous years' patterns, present needs and future growth. Keep abreast of new material by reading reviews in newspapers and journals and put them up so users also learn to make intelligent suggestions.

Visit bookstores on a regular basis. Visit other libraries when possible, for other ideas. Make sure you have material in more than one language. Also try to have some books in Braille. How about some archival material? Try to acquire some. Keep audio and video tapes, CDs and DVDs as well as CDROMs. This way you will be making your users aware of different methods of accessing information.

Now here is where your users actively enter the scene. Invite suggestions from them by having a box, or by having a wish-list notebook prominently in view. Look at it frequently and give your users some feedback. Take groups of students to bookstores and book fairs for selection and purchase. (See further sections for more details.)

4. Organisation and Access: This is where the proof of the pudding comes in! Is the library locked when the librarian is not there? Even if this sounds revolutionary, just let it vibrate in your ears....how about keeping the place open with senior students in charge of locking and unlocking each day?!! You CAN do this when the basic philosophy of the school is one of freedom with responsibility. The library is then in harmony with the school's intentions. Clear conventions based on co-operation, convenience and common-sense appeal to children and they do adhere to them. For example, NOTHING leaves the library without a record of its leaving! If books are missing or lost, there is a notebook for users to fill in the details. This makes the loss a very factual occurrence with no overtones of theft and suspicion attached. Others also enter the picture to remind and search for the books. For me, a book is never lost. It surfaces after three months, sometimes even six months. There are no fines for late return, so frequent reminders are made, generally and individually. By and large, forgetfulness is not a major issue. As the librarian, you must also remember to be talking and relating to your users in various ways which is the basis of all that we do at CFL.

Are your bookshelves unlocked and easily accessible? I hope you do not have very high shelves! They have an unfortunate resemblance to walls. In any case, make sure you put books for younger children within their reach. Do students freely move around, browse, do reference and read in the library?

Organisation of your material goes a long way in making your users independent. The Dewey Decimal Classification Scheme, though not very satisfactory, still gives a broad framework within which local variations can be used. It is also the most commonly used at other libraries so your young users will be at ease in whichever library they visit.

Colored strips to code different categories are very helpful. Students who replace books find this invaluable.

Finally, if you have not yet computerized your collection, start thinking about it FAST! The benefits are enormous and much easier for the librarian to monitor use and nurture openness. We have a program that was created for us by an old student. It is friendly to users from age 6 to 60! One of the many customized features is that you can reserve a book borrowed by someone, and a message is flashed to that user to please return the book soon since it is needed by such and such a person. This is a very unusual way of functioning because it puts the onus on being co-operative on the individual, and not on any system!!! You too can look at any of your alumni who can contribute a software package.

Maintenance and care are an integral part of the library. Do you get nightmares worrying about this? Do create the option of getting student helpers. In CFL, students do community work every morning and one of their jobs in the library is to replace returned books to the right locations. Also there is a group which takes up creative repair work of damaged books. Sometimes we use a library period to do this and other related book care activities. We find students take it up happily and not as a chore. Later, we display these books. One last word. In India we are usually very remiss about providing wheelchair access. Can you please push for that if you do not already have it? I am sure the management will be happy to have you alert them on this aspect

5. Use: Use comes about as a natural outcome of all the aspects we have mentioned earlier. Other ideas that have worked are

- A separate shelf for books of non-fiction for seniors and juniors. These consist of books from the subject shelves that are of general interest but do not get read often. This collection is changed every now and then and has worked well.
- A half-way-home shelf for new books AFTER they have come off the new books display and BEFORE they get hidden and forgotten in their subject shelves. We plan to keep them in this shelf for one term.
- As part of projects, children have created books of different kinds. We have a special shelf for them called In-house publications!

- Adopt-a-book. Children are encouraged to adopt a book or author. This means they must now and then check on the condition of the books, make sure they are being read and cared for!
- Story telling or reading out from a book gives a great impetus to reading.

Besides all these, you can have activities, games, projects, visits of authors, debates and many other ideas to enhance use. (We will go into these in more detail in the next workshop.)

I am not sure where this comes in but I have found it very interesting to share with the children accounts of other libraries and their practices. One favourite story is that in the Bodleian Library at Oxford, every user when asked, must recite an oath in Latin which essentially says they will not damage the books by exposing them to fire, water, food and bad handling! Another is of how libraries try to conserve space by having shelves tightly placed against one another. When the user wishes to browse in a particular shelf, he pushes a button and the shelves slide back giving the space. They always ask what would happen if two people pushed buttons for different shelves! I never found out.

6. Human Resource: This is the most valuable resource the library can have. To have a library that is alive depends on the human being caring for it. Open access is the call you as the librarian MUST make. To take the suggestions given above and to convert and adapt them to your situation is again your privilege! Try to win over teachers and management by showing how involved and energetic you are.

Above all, I hope you enjoy what you are doing because believe me it's a wonderful life!

Here are some things that are OK though they may be No-No in most libraries!

- Use of library for other events is good provided it does not dislocate the collection too much and is held at a time when there are no other users. Different people are likely to come in to the library and discover things!
- No need for deathly silence or hushed whispers in a school library. A low buzz of interactive discussion or sharing is fine.
- Rules are not always sacrosanct. They can be reviewed by the librarian and the user on a discretionary basis.
- Should the librarian be quiet and passive? Not at all! The library is on show, not the librarian, so every opportunity can be taken to highlight or project any happening or innovation there.

Bringing young people and books together

Young people, like many of us adults, have become more and more dependent on the media, internet and computer-driven software for information as well as for entertainment. With the dazzling advances in technology and the fascinating diversity of the media, it is little wonder that a young person's fancy turns more readily to them rather than to books. As educators and librarians, what is our response? The first thing is to recognise and acknowledge the benefits of each of these modes of learning. From there we can make out a case where books are still valued for their unique contribution and happily co-exist with all other forms which provide information, inspiration and entertainment.

When a child reads, there is a relationship which begins between her and the book. It is an enduring relationship, where the reader has the leisure to explore the written word at her own pace, with breaks, at any location, and what is important for a child, in any position! Young children are drawn to stories and are full of curiosity and wonder. Usually this moves naturally into a love of reading. But we may uncaringly or unwittingly dam this natural surge. Very little encouragement to read, hardly any exposure to excellent books, both in the home and school environment, too many other occupations, unmonitored TV-viewing, addiction to computer games, and even too much academic pressure can dry up the imaginative flow. Descartes, the French mathematician and philosopher said, "The reading of all good books is like conversation with the finest minds of past centuries." This is the personal and direct contact we can make through something as simple as reading!

Written language has an enduring quality that cannot easily be replaced. Reading raises questions, sparks off ideas and starts a chain of imaginative thought. By the simple act of reading, young people are expanding and enhancing their sensibilities. They are responding to strong themes, to evocative language and are being exposed to issues they cannot afford to ignore. They are able to get in touch with their own emotions, fears and joys. In reading, they are also learning to read between the lines, pick up nuances and complexities which the author has embedded in her writing. They are picking up the skill to be critical of content and form – to discern when there is insincerity or condescension. Reading also stretches the vocabulary of youngsters from age 6 upwards to age 20, and helps in making their writing more expressive. After a period of reading regularly, the reader is able to discern between fact and opinion so there is a growth of a thinking individual.

Encouraging children to read both fiction and non-fiction from a young age enables them to grapple with concepts, ideas and processes. These inputs will help

them to make sense of the world as they grow up, and also build stamina to read works of nonfiction later in life.

Now, I would like to move on to the essentials that will allow all of the above to happen. But first, think back to your own childhood. What made you read or not read? Both can help you learn about children's patterns. I feel an equal surge of satisfaction to get a non-reader reading as well as help a good reader deepen his reading.

Please use the following questions that I have posed as a check list for yourselves.

Environment

1. Have you provided the right environment for reading in your library?
Make sure that your library has an inviting, bright and colourful appearance. This can be done with the help of posters, sketches and soft boards which your young users contribute to.
2. Is the collection interesting, up-to-date and relevant to your young users?
Try to keep abreast of new books by reading book reviews, visiting bookstores and book fairs.
Keep a notebook or box for students' suggestions and take time to read them.
Take the suggestions seriously.
Take students along to select books from bookshops.
3. Have you provided comfortable and attractive reading spaces in your library?
Have different kinds of seating for different kinds of reading, reference books, computer access, journals and magazines and for browsing through the shelves..
Try to provide little nooks and corners. Children love to read in such spaces.
4. Are you, as an integral part of the environment, friendly and approachable?
There are many instances of great people who remember their school and college librarians with deep respect and affection. Can you qualify for that?!

Exposure

By exposing a child to what is in itself excellent, you can be sure that he will develop standards of his own.

1. So can you set some standards of excellence for the books in your library?
Make sure that when you buy books and subscribe to journals, you take advice from teachers, management, other leading libraries and reviews. Display new books, if possible along with any information about the author. Use assemblies for highlighting any special books or new journals by asking a teacher or parent

who has read it, to say a few words about it. Sometimes an older student can be asked too. Older students are great role models!

2. Do you believe in the value of browsing and do you actively give time for that? Something wonderful called serendipity happens then.
3. Do you subscribe to a good collection of journals?
Many college students only have time to do 'short reads' so your journals will ensure that the reading habit is kept alive for them.
4. Try to take your students on visits to other libraries. This a great learning experience for the librarian and the children.

Ease of access

This covers both availability of good material at bookshops and accessibility to the users in your library

1. Do you have open access at your library?
PLEASE! Don't lock up your shelves or keep books in metal closed cupboards. Books need to be seen, touched, smelt, browsed through and read. If you are worried about mishandling, theft and defacing,, talk to the young people directly. They will respect you for that and the few who may be misusing the library, will get monitored by the others.
2. Do you have simple methods of borrowing and returning?
This is vital. Computerise and make life simpler. Bring about trust by asking users to monitor themselves. Talk, talk, talk to them, not lecture!!
3. Are you aware that the publishing scene has never been more vibrant?
Bookstores are overflowing with new books, secondhand book stores too are growing. So people are reading. As librarians we need to get in on this act.

Encouragement

1. Do you or does the school tend to underestimate the value of reading and put it in opposition to study?
I am sure this does not happen, but we need to be alert to this possibility. As we have said earlier, it is the foundation of all learning, and enlightened managements are already aware of this. You as the librarian need to take a lead in this movement. Highlight award winning books and authors. The human being behind the book is important. Make them aware of this person. Many times children ask me, "Aunty, have you read all the books in the library?" Of course I haven't, but I know something about them all so I give that impression!
2. Do you relate with non-readers equally well?

If you do, unexpected events also help in bringing them into the world of books and reading.

3. Do you think parents need to be helped to realise the value of reading and also to monitor their children's use of computers and television?

If yes, please invite them to your library, encourage them to borrow and read for themselves and to read out to their children. Share with them your inputs on the joys and value of reading. Ask them to give books as birthday presents or as special treats. Tell them about second hand bookshops they can take their children to.

Enhancement and Enrichment

1. Do you have a weekly library period with each class?

If not, please ask for it. For college librarians, can you think of ways to attract users to your library? Have poetry reading and play reading sessions. Help them to form reading groups. Organise mini events like talks by people in your institution who have interests like astronomy or photography or trekking. Ask them to pull out relevant material in your library and display these. The momentum will pick up.

2. If you have it, do you do any activities which enhance awareness and interest in reading?

At all ages, as children grow into young adults, their burgeoning minds need guidance and nurturing to deepen their reading. So we as librarians and teachers must be able and ready to provide this enrichment to their reading.

There are a number of activities that you could do, ranging from care of the library and the books, to discussions and debates on books. (Please see further sections for ideas.)

See if you can set up your students to go once a week and read to blind children or to old people or at an orphanage. Doing this will make them aware how privileged they are to have access to books and reading.

Finally, a young person who has read widely grows into a well-rounded adult. In social and professional interaction, she can hold her own. She is quick to pick up nuances, allusions, quotations and references. We owe it to our young people to actively bring them into a lifelong contact with the best in books and reading.

Bertrand Russell said, "There are two motives for reading a book: one that you enjoy it, the other that you can boast about it."

The teacher and the library: a symbiotic relationship

The library is a responsive entity. With the best of collections, infrastructure and even services, it can spring to life only at the magic touch of the users. And in a school library the users are primarily the teachers, either directly, or indirectly, because through them, the students are initiated into becoming lifetime users.

Why is it so important that a school library be alive, vibrant, and continuously evolving?

It is the place to which fresh, young minds bring their curiosity and thirst for knowledge.

It is the place where the spirit of enquiry in teachers is met, sustained and strengthened.

It is the place where librarians face the exciting challenge of making the library a “happening” centre.

Finally, it is the place that heads of institutions realize and recognize is the core of the educational process.

The inter-relationship between all these elements also creates an inter-dependence and no one aspect can grow without the warmth and sustenance of the others!

Here, my focus is on teachers but as you will see the implications for librarians and heads is inherent.

A natural way to bring meaning to our lives is to do something we believe in. Something we feel happy to do. In such a situation, we are learning and innovating constantly. There is no room for monotony or a sense of drudgery. Learning is essential to teaching. This is a statement I cannot over-emphasize. John Dewey’s observation about the combined forces of reflection and action is significant here. As teachers you need to have, and to convey to students this reflective-learning stance. Changing circumstances, new developments, technological and psychological transformations that are taking place all around us demand that as teachers you have an intelligent response. This is necessary to tackle new issues that are thrown up each day that may even become obsolete by tomorrow! The nature of academic learning is also influenced by the availability of and use of, new technologies.

As teachers and educators, can you see yourselves opening a conversation when you begin a lesson? In order to carry on an interesting and rich conversation, and even to communicate clearly, you must have some resources to draw upon. It is impossible to draw on one’s resources without replenishing them frequently. So....Enter the library—your school library...other libraries—to restore and refurbish and refresh your store of abilities and knowledge.

Educators know from experience that it is necessary to understand an area of learning in order to teach it well, but that understanding on its own is not enough. So what else is needed? First, a deepening of knowledge in the specific content area of your subject. Second, a broadening of perspective. Connections and links, both local and global are made. How does this help the individual, the student and the institution? For the individual I would say there is tremendous potential for personal growth. Existing interests strengthen, new questions arise and the process of self-development is well on its way. There is not just the appearance, but also the fact of self-confidence. It does not need a psychologist to tell you what that means to your general sense of well-being and harmony.

As for the institution – an innovative, confident and creative teacher is a valuable asset. She is a strong spokesperson for the place as well as being an individual in her own right. The really good teacher is one who can call her soul her own.

For the students, a teacher who is well-read, both in her own subject and outside it, provides a model and a source of inspiration. A teacher who has a strong base of reading, reference and research has an air of quiet authority and security. A young student at our school was particularly struck by the fact that Albert Einstein's teachers at his high school punished *him* when *they* could not answer his questions! The primary role of reading, researching and referencing is done by the teacher but gradually as the students begin to use the library more extensively, they take over the primary role and look to the teacher only for affirmation and confirmation. They are ready to be self-sufficient. However the teacher continues to be the motivator and the facilitator.

But – and I should have asked these questions first – Do you believe and trust that time spent in the library is time well spent? Do you have a positive attitude to the library? If the answer is YES, I go on to list a few more areas of self-development that the library can provide.

- Read to understand how what you are teaching fits into the overall curriculum. If, as a teacher, you are part of curriculum meetings, you need to be clear what the issues are.
- Read to enhance your teaching and communication methods – classroom management, current approaches and innovative techniques.
- Read to recognise and understand a particular child's difficulties – physical or psychological. Parenting and teaching are both highly demanding and creative responsibilities.

Even when a teacher has all this background, I am sure you see the necessity for ongoing updating.

How do you actualize this and begin?

1. The first step is to orient yourself to the library and the varied facets of the collection as well as the services provided. I always ask librarians to begin the school year with a 'familiarising and getting acquainted with the library' session. But if for any reason it does not happen, make the first move yourself. Next, you must constantly throw friendly challenges to the librarian. Access to material, availability, ease in searching and finding, quiet time for browsing, suggestions for the collection and arrangement, queries for reference....go ahead. No librarian worth her salt should object provided it is done in the right spirit. Talk with students to discover areas of special interest. Talk with the librarian to search for, highlight and make available relevant material.

2. Use a variety of media to teach. Take your students to the library to show them related material – videos, CD-ROMs, films, maps, audiotapes, archival material.....

3. Primary class teachers : Use poetry books to do projects. Choose a story and get your class to write scripts and enact them. Use books on crafts, science experiments, clay work, maths puzzles to evoke individual responses in your students. For any fair or mela, get ideas in the library for motifs, decorations, artwork....the possibilities are endless.

4. For older classes, I have invited teachers to come in and do a book talk on a book they have read recently. Students are intrigued to see their subject teacher in a different garb. For the teachers too, it is an opportunity to bond with their students differently. One idea that I had was for book talks to happen within a class in the specific subject areas. For example, a Maths teacher or a Biology teacher could recommend that some books which would deepen the interest of the student in the subject be read and presented in a book talk. This is very different from a general book talk in the library where a larger audience attends. Here with a subject-oriented book talk, the teacher will find the possibility of a discussion taking place based on the book.

5. Teachers' suggested readings both in Fiction and Non-Fiction are displayed or listed on the library board. Teachers, you can also alert students and even your colleagues regarding any interesting articles you have read in a periodical in the library.

6. Usually projects done by various classes are displayed in the library. If you as a teacher visit regularly, seeing these might trigger off ideas for you. Also, if you see a student's efforts in a different area, it would help you to view that student in a fresh light.

7. If you have any artefacts from a trip you have made, you can exhibit them in the library and talk about them, if possible. If you have some memoirs or old scrapbooks of archival interest, bring those in for a temporary display.

8. Use the newspapers and journals to do a unit on current events. Bring about discussion and debate on terrorism, the war in Iraq, India-Pakistan relations, gender issues...the list can go on. If you alert the librarian, she can look for relevant material of all kinds.

9. At our school and earlier where I worked, teachers always came along on book-buying trips to stores, sales and book fairs. So there is an immediate correlation between the selector and the user! Then too, teachers have come in to help with weeding out and discarding books in their subject areas. This is a tremendous help for the librarian who does not have specific subject expertise.

10. Suggest visits to the outside, suggest visitors from outside – any interesting contacts you may have. All this enriches the library which in turn enriches you.

11. Teachers' writings and participation in seminars or workshops must be shared on the library board. Some teachers have actually written books about their experiences and efforts, which naturally find a valued place in the library. When school excursions take place, the teacher and students maintain a diary. This too finds a place in the library for future travellers or even for informative reading.

12. Suggestions on aesthetics and ambience in the library will surely be welcomed by the librarian since it comes from a genuine interest and involvement from the teacher.

13. Remember, teachers, to take your students to the library for reference sessions. A change of scene will be refreshing, and work wonders on both you and the students!

You may now ask, how am I to do all this? Where is the time? This is where enlightened management comes in. In each teacher's time-table, put in one period a week as a personal library period – not to be confused with bringing students in for a reference period. Believe me, this is not an imposition. After just one term, you will be looking forward to this period of quiet browsing, leisure and freedom to pursue your interests. The management must recognise that this is a long-term investment and encourage this move.

As a librarian, may I list the following Don'ts for the teachers and the heads please?

DON'T send students to the library as a punishment for some failing.

DON'T send them there to complete their homework either. Both these give

the wrong message.

DON'T use the library as a classroom (lecturing time) or a meeting room.

DON'T use the librarian as an office clerk or general dogsbody.

DON'T use the library collection as a showcase to impress visitors. If a library is doing what it is meant to do – it should be full of users and less full of books!

Till now I have not given any specific ideas or suggestions to librarians but I am confident that as you are reading, you are picking up the connections and links to your own place in this network. There are three categories of users that make us librarians who we are! They are the students, the teachers and the management. We need to embark on a relationship of trust, efficiency, dependability and friendliness with all three sets of users.

The students are the easiest to win over. They are young, open and eager to learn. Show them clearly by word and deed that you are there to help them and guide them regarding new technologies and to make resources available.

- Make them feel welcome in the library.
- Invite them to help you. Take their suggestions for books and improvements in the library seriously.
- Photocopy material which they need. Volunteer to do this rather than as a big favour! If you see a great demand for some books, ask the management to let you buy one or two more copies, assuring them that there will be good use made.

Now for the teachers...as librarians we must MAKE them believe in the efficacy of the library. You can only do this by your actions and your services not just by word alone. You must convert them to become regular users and strong supporters of the library. Their presence in the library is the proof of this.

First, invite them for an orientation to the library, literally a guided tour. Show them your collection of maps; make them aware of the play scripts available. What about unusual books that may be tucked away and forgotten? Pull them out and show them. Newsletters and pamphlets from related institutions should be made available to them.

If you know of the special interests of the teachers, be sure to alert them about any corresponding material. At the beginning of the year, get the teachers to fill in a form listing their needs and projecting their plan of topics for the term. The form could also ask for interests other than what they are teaching. Also ask them for suggestions. This puts the onus on them not us! Ask them for a commitment on what they would like to be involved with, i.e. any particular aspect.

You as the librarian are in a unique position to provide an alerting service to the teachers because you have a picture of the whole library. So without too much effort on their part, teachers can present a multi-dimensional approach to their teaching.

Now for the management or heads. Probably the greatest level of difficulty is to have a smooth but open and frank relationship with the management. Don't forget though that without their encouragement and support, you would probably not be here today, listening and participating. To win over the trust and confidence of the head is the most important task, because if that does not happen, many of the things I have said today become meaningless and just words. Be bold in word and deed. If you have and show clarity, energy and commitment, the head must listen. After all teachers and librarians are the ground on which the school stands or falls.

Now what of ourselves as librarians? What can we do to bring enrichment to our lives?

- Create a climate of confidence – not authority and arrogance.
- Put in the effort to be familiar with your own collection and resources. I often hear children tell each other – “Aunty has read all the books in the library!” Obviously not but I do create that impression because I have some idea about all the books. I watch and remember who has read the book, what they said about it, who gifted it or where it was bought...I remember the author, the illustrator, the publisher...enough to make the connection when I hear of something related next time.
- Wherever I go, I am always looking out for ideas that catch my eye. As a teacher or a librarian, I can bring them back to my library and my classroom.

Librarians manage users and resources. Teachers manage students and subjects. So can you find a more dynamic information team than teachers and librarians?

Section Two: Workshops for Junior Age Groups

Junior Math

Arthi Saktheeswaran and Suseela Kumaravel

Mathematics for five to ten year olds

It is important for us educators to continuously enquire into the following two fundamental questions:

- 1) What comes in the way of learning?
- 2) What facilitates learning?

When attempting to answer the first question it is very clear that fear is one of the main factors that come in the way of learning. It could be fear of the subject and/or the teacher or the fear of not being able to meet the expectations of parents/teachers. Fear of being ridiculed if the answer is wrong can prevent the child from trying. Comparison and competition too breed fear. Learning suffers when the teacher is only interested in finishing the curriculum. Learning cannot take place when parents/teachers are anxious about the results.

The answers to the second question follow from the first. It is imperative that the learning atmosphere is free of fear. Parents and educators need to continuously work together to cast their expectations aside. We need to bear in mind that each child's abilities and potential are unique and hence comparison has no place if one wants to facilitate learning. While competition might achieve short term goals, it cannot bring about an internal motivation to work. As children, especially the young, are naturally interested in learning, our work as teachers becomes easy and enjoyable if we take on the role of facilitating that learning.

Now, how do we teach mathematics to the young? Our job is often made easy because almost all the children who come here seem to 'like' mathematics. Occasionally we come across exceptions. Sometimes, when a child enters CFL she/he avoids math saying that he/she doesn't like it. Often before the end of the first term such statements disappear.

We cannot teach a subject that we don't love ourselves. We cannot help a child learn it if there isn't a rapport between us. When fear is eliminated obviously it allows for a rapport to build up. Thus when all the above factors are taken care of then learning continues to take place provided there is leisure for the teacher and the taught.

I am sure all of you know that the young need to start leaning mathematics

using concrete materials and then move on to pictorial representations and finally to abstraction. The child needs to experiment/explore with concrete materials till the concepts are clearly understood. The emphasis obviously is on understanding rather than learning the algorithm through repetition. There have been times when we have allowed a child to carry on with algorithms if understanding didn't come about after varied attempts and such children often have difficulty with word problems. It goes without saying that such children need remedial help.

Children need encouragement to try out different ways to solve problems. They need to understand that different methods can lead to the same answer. One last but important factor for the teacher to remember is to begin 'where the child is at'. Often for the six year olds moving from addition to subtraction is a leap and then to move from there to subtraction with borrowing is an even bigger leap. Thus when they encounter the following problem they often go about solving it the way it is described below:

Raghu has Rs34/ and Raji has Rs25/. Who has more? How much more? Often the correct answers are arrived at very quickly. When asked how they got Rs 9/ invariably they say that they counted from 26 to 34. Then they are asked to write the number sentence which they do as follows: $25 + 9 = 34$. Of course this is correct. When asked to write a number sentence using subtraction they find it difficult. One thing that helps is giving the child the same kind of problem involving smaller numbers. The patience with which this situation is handled is bound to bear fruit later. It is actually very rewarding to know that by the time the children come to the next level this concept is well mastered.

I would like to mention something that all of you must be doing as well i.e. combining fractions with cooking and money obviously with shopping games. Estimation helps them learn about measurements. Through the years they are encouraged to estimate endlessly.

Out of all the materials we use some are worth mentioning here.

- 1) Straws and rubber bands for place values
- 2) Play money
- 3) Response cubes
- 4) Response wheels
- 5) Decimal chart
- 6) Game mats
- 7) Thinking Stories

In this workshop we would like to focus on thinking stories which is an

important aspect of our curriculum. Levels one, two and three have 20 thinking stories each and about 200 word problems, while levels four and five have a different format; in these levels there are longer stories and each story is divided into three – six parts. We have prepared a sample booklet comprising of two thinking stories from each level. We have made use of the ‘Real Math Open Court’ thinking story books for this purpose and adapted the stories to suit Indian contexts.

While doing thinking stories with the children many of the factors that are conducive to learning are taken care of often without a conscious effort. I will mention these factors below:

- Development of lateral thinking – children get to understand that there are different approaches to the same problem.
- Opportunity to look at what it means to ridicule/ get ridiculed. One of the characters in the story is characterized purposely as someone who cannot work with numbers. The other characters patiently explain everything to him. Children listening to this hopefully begin to patiently explain what they know to those that don’t know.
- Understanding is more important than just getting the answers. Children realize that yes, no or can’t tell answers require explanations.
- When faced with questions that have more than one correct answer, children feel happy that their answer is as valid as another’s. They learn this through debating their explanations.
- Slowly, the sense that ‘I am right therefore I am great’ or conversely ‘I am wrong and hence I am useless’ loses its strong hold. This learning speeds up when there is no trace of comparison in the teacher’s mind.
- Children learn to be patient with those that need more time to solve a problem.

For every 7 – 8 lessons there is a thinking story and each story is connected to the concepts being taught through the lessons. It is needless to mention here that these concepts get very much reinforced through the stories and the subsequent word problems. There are also problems that reinforce the earlier concepts learnt especially in the lower levels.

The format changes in Level 4. There is one main story which has four or five parts. These parts are interspersed amongst the lessons. The children gradually work through the parts to solve a plot completely only at the end of the last part.

The main characters in the Thinking Stories

Each of the characters in the ‘Thinking Story’ is unique; they each have their own style of thinking and mannerisms. The children learn to recognize the flaws in the thinking and try and avoid it.

Venkatesh Uncle is always forgetting things. The children learn to keep in mind the kinds of things that he forgets.

Raju is over-confident and impulsive. The children learn to consider the facts that he ignores.

Rashmi, Raju’s younger sister, is more careful and does not jump to conclusions.

Parvathi Aunty is very unclear in what she is talking about and people find it difficult to understand what she is talking about.

Krishna Uncle usually talks a lot and confuses people by giving irrelevant details. The children learn to distinguish the relevant from the irrelevant.

Vivek often asks questions that help people clear up their problems.

Sanjana thinks that everything happens by magic.

Raghu Uncle is very creative and always makes something new from material that he has. The children learn to perceive what he has made through mental imagery.

Akash only wishes for what he wants to happen. The children think of ways to make things really happen.

Level 1 Subtraction

Maya’s Magic Minus Machine

Maya was dreaming about a magic machine again. This machine was just like the ones she had dreamed about before, except that if you put in 5 things, it would give back 4; if you put in 6 things, it would give back 5; if you put in 9 things, it would give back 8.

What was the machine doing? (Taking away 1)

When Maya woke up, she decided that she could build a magic machine like that. She found a big, big box. On it she painted a sign that said “MAGIC MINUS MACHINE. Whatever you put in the top, you get back 1 less at the bottom. FREE!”

Maya put the magic machine out by the gate in front of her house and hid inside it. Soon children began flocking around the machine and reading the sign. “It’s free!” Rashmi said.

Vivek was the first to try it. He put in 7 sticks. The machine went “Boom-Boom” and out came 6 sticks at the bottom.

What do you think made the machine go “Boom-Boom”?

What do you think happened to the other stick that Vivek put into the machine?

Raju wanted to try the machine next. He put in 9 marbles.

How many marbles will he get back? (8)

“Hey,” said Raju, “the machine kept 1 of my marbles!” Raju was angry and walked away.

Vivek tried the machine again. He put in 4 bubble gums.

How many bubble gums will he get back? (3)

The machine went “Boom-Boom” and out came 3 bubble gums at the bottom. Vivek didn’t like that very much, but he said, “I’m going to put them back in the machine, and maybe this time more will come out.” He put his 3 bubble gums into the machine.

Will he get back more than 3?

This time the machine gave him back only 2 bubble gums. That made Vivek angry, and he walked away.

Rashmi felt in her pocket and found 5 bean seeds that she had been saving to plant. She dropped them into the Magic Minus Machine and waited eagerly to see what would happen.

What will happen? (She’ll get back 4 seeds)

The machine went “Boom – Boom” and out came 4 bean seeds. “Nasty machine!” said Rashmi, and she walked away. Soon none of the children would have anything to do with Maya’s Magic Minus Machine.

Why not?

Then Akash the Wisher came along. He had just finished eating a banana. “I wish I had someplace to put this banana peel,” said Akash. “I wish there was a wastebasket right here.” Then he noticed the Magic Minus Machine. He put the banana peel into the top.

What do you think will come out the bottom?

When you put in 1 banana peel, how many banana peels do you get back? (Zero)

The machine went “Boom – Boom,” but no banana peel came out the bottom. After that, whenever people had some trash to get rid of, they put it into Maya’s Magic Minus Machine.

Problems

1. Maya dreamed about another magic machine. She put in 3 tamarind seeds and got back 6. She put in 2 cards and got back 4. She put in 1 card and got back 2.

What was the machine doing? (Doubling the number)

What will Maya get back if she puts in 4 sticks?(8 sticks)

2. All the children were eating dosas. Akash was the second one to finish. Maya was the fourth.

Who ate faster- Maya or Akash? (Akash)

How can you tell?

3. Rashmi saves Rs 2/ every day.

How long will it take her to save Rs 20/ (10 days)

4. Rashmi was learning to walk on stilts. The first day she could take 2 steps before falling. The next day she could take 4 steps. The next day she could take 6 steps.

How many steps would you guess she could take the day after that? Why do you think so?(Any answer will do, although 8 is the obvious one. What is of interest is the reason given.)

5. Akash got 4 chikkis. "I'm only going to eat 2 chikkis every day," said Akash, "so they'll last a long time."

How many days will they last? (2)

6. Rashmi needed to go to Venkatesh Uncle's house, she walked past one house with her friend Deepika. Then she had to walk past 3 times as many by herself.

How many houses did Rashmi go past?(4)

7. Akash walked half a kilometer to the post office. Then he walked half a kilometer to get home.

How many kilometers has he walked altogether? (1km) How many meters has he walked altogether? (1000 meters)

8. Raju decided he was going to be nice to 5 people today. He tried and tried, but so far he has managed to be nice to only 2 people – himself and Venkatesh Uncle.

How many more people does Raju need to be nice to? (3)

9. "This is the fourth time I've been to the zoo," said Rashmi.

How many times had she been to the zoo before? (3)

10. Rashmi had 4 dolls. She gave a doll to Akash and a tennis ball to Maya.

How many dolls does she have left? (3)

Level 1 Planning and Measurements

Vivek Builds a Birdhouse

Vivek has been learning carpentry in school and in the holidays he built a big, beautiful birdhouse. He made it out of a wooden box. He put a roof on it,

painted it green, and set it on a post in the back garden. Behind his house there was a mango grove. Since there was a mango grove many birds came to visit Vivek's back garden too. A pair of hoopoes came and looked at it, but they didn't go in. "No wonder," said Vivek's mother. "You forgot something important."

What do you think Vivek forgot?

"I see what it is," said Vivek. "I forgot to make a hole in the front of the birdhouse so the birds can get in!"

Vivek went down the street to Venkatesh Uncle's shop and borrowed a drill from him. With it Vivek drilled a hole about 3 centimeters wide in the front of his birdhouse.

How wide is 3 centimeters? Show with your fingers. (Demonstrate the correct width)

The next day the hoopoes came again and looked at Vivek's birdhouse again, but still didn't go in.

Why not?

"I'm afraid that hole is too small for those hoopoes," said Vivek's brother. "What you need is a hole that's the same size as the hoopoes."

Vivek went back to Venkatesh Uncle and told him he needed something to cut a bigger hole in his birdhouse. "Exactly how big?" asked Venkatesh Uncle.

"I don't know exactly," said Vivek. "It should be a sort of hoopoe-size hole."

"You'll have to find out how wide the hoopoes are before you'll know how wide a hole to make."

Vivek took a ruler and went out and tried to measure the hoopoes.

Do you think that worked? Why not?

The birds were friendly because Vivek had often been feeding them and he had no trouble getting close to them; but every time he reached out to put the ruler against one, it flew away.

Vivek's friend Rashmi said, "I have an idea. Why don't you find a picture of a hoopoe in a book and measure the picture? The picture won't fly away."

Does that sound like a good idea? Why not?

Vivek's father was interested in bird watching, so there were many books on birds in the house. Vivek looked through Salim Ali's book on Indian birds until he found a picture of a bird that looked just like the hoopoe that had come to his bird house. He measured the picture with his ruler and found that the bird was 3 centimeters long. "That can't be right," Vivek said.

How did Vivek know that couldn't be the right size? (If birds are wider than 3

cm, they surely must be longer.)

Vivek took the bird book over to Venkatesh Uncle's house and showed the picture to him. "Here's the kind of bird it is," said Vivek, "but I can't find out what size it is."

"Oh, I know that kind of bird," said Venkatesh Uncle. "There are some birds like that building a nest in my house, up in the bathroom."

"How do they get in and out of your bathroom, if the door and the windows are shut?"

"There's a hole in the wall just big enough for them to get through," said Venkatesh Uncle. "I had that hole made to fix a tiny exhaust fan, it hasn't been done and now I will wait till the birds have raised their young."

Does that give you an idea?

How could you find out what size hole to make in the birdhouse?

Vivek hurried up to Venkatesh Uncle's bathroom and measured the hole in the wall. It was just 7 centimeters wide.

How wide is that? Show with your fingers. (Demonstrate)

Venkatesh Uncle didn't have a drill 7 centimeters wide, but he has a little saw that would do the job. He and Vivek cut a neat hole 7 centimeters wide in the front of Vivek's birdhouse. Before long the hoopoes came back. This time they went inside and came out again and soon began bringing grass and feathers to put inside their new home.

Problems

1. "I want to measure the inside of this box," said Vivek, "but it's too small to get the ruler inside."

Can you think of some ways to measure the inside of the box? (by using string, a paper strip and so on)

2. Akash has a piggy bank with different slots for 50 paise and one rupee coins. The one rupee coins will not fit into the slot for the fifty paise coins. Do you think a 50 paise coin will fit in the slot for the one rupee coins? (Yes)

Why? (A 50 paise coin is smaller than a one rupee coin)

3. Parvathi Auntie likes rings, so her husband bought her a ring for every finger on each hand, including the thumbs.

How many rings did he buy her? (10)

4. Maya had 2 one rupee coins. She spent 1 for a red balloon.

How many one rupee coins did she have left? (1)

5. Rashmi has 9 marbles. Akash has 1 more than that.
How many marbles does Akash have? (10)
6. Vivek walked 1 kilometer to school. After school he got a ride back home.
How many kilometers did he walk altogether? (1)
7. For snacks Venkatesh Uncle ate 2 ears of sweet corn and 2 katoris of puffed rice. He forgot to clean his plate and just left it next to the sink in the kitchen.
How many corncobs were on the plate? (2)
8. A mother duck had 4 ducklings. When she wanted to go somewhere, she quacked so the ducklings would all follow her. One day when she quacked, 1 duckling came out of the basket and 2 came out from under a bush. After a while another duckling came out of a pile of straw.
How many ducklings were still lost? (Zero)
9. Raju lives in an apartment on the second floor. One day he looked out his window and said. "I wonder how far it is to the ground."
How could he find out? Can you think of ways to measure how far it is? (Drop a string, then measure it; measure from the first floor to the ground, then double the measure; ask somebody who knows; estimate on the basis of a known height nearby.)

Level 2 Fractions

Half a job

Even though Venkatesh Uncle was not very good with numbers he was very good with his hands; he could do all the repairing jobs in his house himself. For some time now he hadn't found time to do all the maintenance work, so year by year, things grew worse in Venkatesh Uncle's house. "Everything needs fixing, everything needs painting," he groaned.

"I'll tell you how I handle that problem," said Parvathi Auntie who lived near by. "When a job is so big that I don't feel like starting it, I just do half the job each day. That way it isn't so hard."

How long does it take Parvathi Auntie to do the job? (2 days)

"Half the job each day," said Venkatesh Uncle. "That sounds like an excellent idea. I'm going to try it. I think I'll start today with painting the walls in this room."

"Good luck," said Parvathi Auntie. "I'll be back in a week, and I expect I'll find this house in much better shape if you follow my advice and do half a job every day."

Venkatesh Uncle got out paint and brushes and he started painting the walls in that room.

How many walls should he paint the first day if he is going to do half the job?(2)

After careful counting, Venkatesh Uncle discovered that there were 4 walls in the room. And he figured out that half of 4 is 2. And so the first day he painted 2 walls.

The next day Venkatesh Uncle got out his painting materials again and was ready to start work. "Now, what was it Parvathi told me to do?" he asked himself. "Ah, yes, I remember. Do half the job each day. There are 2 walls that need painting, so if I do half the job today, that means I paint 1 wall." Venkatesh Uncle painted one of the walls.

Do you think that is what Parvathi Aunty meant? (No)

What should Venkatesh Uncle done instead? (Do the other half by painting both walls)

The next day Venkatesh Uncle said, "This idea of doing only half the job each day really makes life easy. It didn't take me very long at all to do my painting yesterday, and today it should take even less time."

How many walls are left to be painted in the room? (1)

How much do you think Venkatesh Uncle will paint today? (Probably $\frac{1}{2}$ of the wall)

Venkatesh Uncle noticed that only 1 wall in the room needed painting. Since the rule was to do half a job each day, he painted only half the wall that day.

How many walls has Venkatesh Uncle painted so far? ($3\frac{1}{2}$)

How much painting is there still left to do? (Half a wall)

Do you think Venkatesh Uncle will finish the room the next day? Why or why not?

The next day Venkatesh Uncle had a very easy job. There was only half a wall left to paint. So his job was to paint half a wall. But he remembered that he was supposed to do only half the job that day.

How much did Venkatesh Uncle paint that day? ($\frac{1}{4}$ of the wall)

How much of the last wall is still not painted? ($\frac{1}{4}$)

About how wide would a fourth of the wall in an ordinary room be? (Maybe 1 meter)

By the next day there was only a strip of wall left to be painted, and it took Venkatesh Uncle just a few minutes to paint half of it. Every day the strip of wall

that was unpainted grew narrower. Every day Venkatesh Uncle painted only half of what was left.

Do you think Venkatesh Uncle will ever finish painting the wall?

Why or why not?

A week later Parvathi Aunty stopped by to see how Venkatesh Uncle was coming with his work on the house. "What have you been doing?" she asked. "Just painting the walls in this one room," said Venkatesh Uncle.

"That's strange," said Parvathi Aunty. "I thought that job would take you only 2 days."

Why did Parvathi Aunty think it would take only 2 days to paint the room?

"You've done a beautiful job of painting this room," said Parvathi Aunty, "but you seem to have missed a little strip on this wall."

Why is there a little strip that isn't painted?

"I haven't missed it," said Venkatesh Uncle. "I'm still working on it. I'm following your good advice and doing half a job each day. For a while the work kept getting easier and easier because every day I had less to paint. But now it's getting harder. The strip is so narrow that it's very difficult to paint only half of it. I have to go very slowly, because if I'm not careful I might make a mistake and paint the whole strip at once."

What would happen if Venkatesh Uncle painted the whole strip at once? (He'd finish painting the room)

"I'm afraid I didn't explain my idea well enough," said Parvathi Aunty. "I meant that you should do half the job the first day and the rest of it the next day. That way you do the whole job in 2 days."

"That's a hard rule to follow," Venkatesh Uncle said. "You have to remember what the whole job is. It's easier for me if I just look each day and see what needs to be done and then do half of it."

"Then I think you'd better just forget about my advice and try to do a whole job in one day," said Parvathi Aunty. "Otherwise it will take you forever to finish one job."

Why would it take Venkatesh Uncle forever to finish?

(He always left half of what there was yet to paint.)

Problems

1. Venkatesh Uncle wanted to build a fence 3 meters long in his kitchen garden. He built 1 meter of it the first day. The next day he built half as much as the day before, and the next day he built half as much as that.

Is the fence finished? (No)

Does Venkatesh Uncle have more or less than 1 meter left to build? (More)

2. Venkatesh Uncle started reading a book. The first day he read for 2 hours. The next day he read for half as long, and the next day he read for half as long as that.

About how many pages has Venkatesh Uncle read? (Can't tell; we know how long he read, but we don't know how much he read)

3. A painter left his ladder leaning against the wall of a house. The ladder was 4 meters long.

About how high up on the wall do you think the ladder reached? (3 to $3\frac{1}{2}$ meters would be a good guess, but certainly less than 4.)

4. Krishna Uncle had 200 notices to put up around town. He gave half of them to Vivek, one-fourth of them to Maya and the rest to Akash.

How many notices did Vivek have to put up? (100)

How many did Maya have? (50)

How many did Akash have? (50)

5. In her cupboard Parvathi Aunty had 3 cans. They were all sealed shut, they looked alike, and none of them had a label. "I need some cotton," she said. "I know that one of these cans is filled with cotton, another is filled with sand that I brought back from Jaisalmer after my vacation there, and another is filled with water from the Ganges. I wish I didn't have to open all of them to find the one that is filled with cotton."

How could Parvathi Aunty tell which can is filled with cotton without opening any cans? (by picking the one that is the lightest).

6. Parvathi Aunty asked Vivek to go to 5 shops to do shopping for her. "How long will that take?" asked Vivek.

"The shops are 10 meters apart and it takes about 5 minutes to go from one shop to another."

Does Vivek know how long it will take him? (No)

Why not? (He doesn't know how far it is to the first shop, then he doesn't know how long he will be in each shop, and he doesn't know how long it will take to get back from the last shop)

7. "I know all about fractions," said Raju. "You asked me what one-third of 30 is. That's easy. It's 27."

What is one-third of 30? (10)

What did Raju do wrong? (He subtracted 3 from 30)

8. “My cat is 10 years old and weighs 3 kilograms,” said Vivek. “How much does your cat weigh?”

“My cat is 3 years old,” said Rashmi. “So she must weigh 10 kilograms.”

Is Rashmi right? (No)

Why not? (Her cat’s age is the same as the weight of Vivek’s cat, but that does not mean that her cat’s weight is the same as the age of Vivek’s cat)

9. Akash promised Anita, his younger sister, that he would clean all the toys out of her sandbox and fill it with sand. She had toy animals and cars and trucks and buckets and spades all over the bottom of the sandbox. “Three bags of sand will fill the sandbox to the top,” their father said. But when Akash started pouring sand into the sandbox, he found that it was full after he had emptied only 2 bags of sand.

Can you think of any reason why the sandbox wouldn’t hold 3 bags of sand? (Akash forgot to clean out either the toys or the old sand.)

10. Krishna Uncle had a dog rearing business. One day Vivek, Maya and Raju helped him. “Here’s some pocket money for you,” said Krishna Uncle. “Raju, you worked 8 hours, so you get half of it. Maya and Vivek, you each worked 4 hours, so you each get one-fourth of it.”

Did Krishna Uncle divide the money fairly? (Yes)

How can you tell? (Raju got twice as much for working twice as long.)

Level 2 Measurements

Measuring Comet

Krishna Uncle loves dogs and he very often looks after other people’s dogs when they go on holidays. He also runs a dog training school.

“I could use some help,” Krishna Uncle said. Maya and Rashmi who were there at the moment said they’d be glad to help.

“It won’t be as easy as it sounds,” Krishna Uncle told them. “I need to find out some things about this dog, Comet. First I want to know how much he weighs; he hasn’t been eating well since coming here you know. There’s a scale in the workroom. Tell me how many kilograms Comet weighs, if you can find out.”

Rashmi and Maya thought that would be easy. They took Comet and set him on the scale, but he jumped right off. They tried again, and again; but he jumped off before they could see how much he weighed. Maya tried casting a magic spell over Comet, but even that would not make him stand still. He was a very lively dog.

“This isn’t as easy as we thought,” said Maya.

Do you have any ideas about what they could do?

"I'll hold him on the scale and you read what it says," Rashmi suggested.

Rashmi had to press down hard on Comet to keep him from jumping off.

"Twelve kilograms," Maya read.

Do you think that is what Comet weighs?

Why not?

"I'm not sure that's right," Maya said. "The harder you press to hold him down, the more he seems to weigh. I think you're pushing the scale down. Let me try."

Maya picked Comet up and held him so that his paws just touched the scale.

"Two kilograms," Rashmi read. "I didn't think Comet was that light."

Do you think 2 kilograms is the right weight?

Why not?

"I think you're holding him up so that his whole weight isn't on the scale," Rashmi said.

"That makes him seem lighter than he is. I have another idea."

Rashmi held Comet in her arms and stood on the scale with him. The scale read 33 kilograms.

"Thirty-three kilograms!" Rashmi said. "This dog is a monster! Funny, he doesn't feel that heavy."

Do you think that is how much Comet weighs?

What is Rashmi weighing? (Herself and Comet together)

The girls thought and thought. They waited, hoping Comet would fall asleep so they could lay him on the scale. But Comet kept jumping around, lively as ever. Finally Rashmi had an idea. She stood on the scale alone.

"I weigh 23 kilograms," she said.

How can that help them find out how much Comet weighs?

If Rashmi weighs 23 kilograms and Rashmi and Comet together weigh 33 kilograms, how much does Comet weigh?(10 kg)

"I get it, Rashmi, Maya said. "If you weigh 23 kilograms and you and Comet weigh 33 kilograms together, then Comet must weigh 10 kilograms, because 23 and 10 make 33. That's almost magic."

They rushed to tell Krishna Uncle, who was proud of the girls for being so clever. "Since you were so good at finding out how much Comet weighs," he said, "perhaps you can find out how tall he is."

The girls thought that would be much easier. Maya took a meter stick and

stood it up beside Comet's head while Rashmi held him still.

"I can't tell," Maya said. "Sometimes the top of his head is about 40 centimeters high and sometimes it's only 30. He keeps bobbing his head around too much." "Naughty Comet!" Rashmi scolded. Comet felt bad at being called naughty, and he hung his head low.

"Now I have it," Maya said. "He's only 20 centimeters high."

Do you think that is right?

Why not?

"His head is lower than his back now," Maya said. "That will never do. Here, let me try some magic on him." Maya held her magic wand over the dog and said, "Sit, Comet, sit!" Comet obediently sat up on his hind legs and held very still.

"Now he's 50 centimeters high," Rashmi said. "I'll bet that's right."

Do you think it is? Why not?

"I'm afraid that won't do either," Maya said. "When he's sitting up that way it's more measuring how long he is than how tall he is."

The girls had run out of ideas. They went to Krishna Uncle sadly and told him that they had failed. "Comet is a different height every time we measure him," Rashmi said. "He just won't hold his head in the same place all the time."

"That's the way dogs are," said Krishna Uncle. "That's why we usually measure their height at their shoulders instead of their heads. Didn't I tell you that?"

Problems

1. Krishna Uncle was teaching Vivek how to give medicine to a dog. "Hold the dog's lower jaw tightly with your left hand; then give it the medicine."

Which hand should Vivek use to give the medicine? (The right)

2. "We have some collars, but we don't have enough," said Krishna Uncle. "Each dog needs its own personal collar, and there are 10 dogs. Will you go to the shop and buy some, Vivek?"

Does Vivek know how many to buy? (No)

Why not? (He doesn't know how many collars they already have)

3. "Comet likes to be walked exactly 2 kilometers a day," said Krishna Uncle. "He was walked 70 meters this morning, I walked him 80 meters about an hour after lunch, and I'll be walking him 50 meters this afternoon. Maybe he would like another walk this evening."

How many meters will Comet want to walk in the evening (zero)

Why? (He will have already walked 200 meters)

4. Vivek asked Raju to help him give deworming medicine to the dogs at

Krishna Uncle's house. "There aren't many dogs today. There would be 10, but 2 are being walked, 2 are at the veterinarian's and 3 are sleeping."

How many dogs will the boys have to give the medicine to? (3)

5. Krishna Uncle was giving Vivek his work for the day. "Feed all the dogs and walk them before they eat," he said. "And you'll have to get the dog food out of the garage."

How many things does Vivek have to do? (3)

What should he do first? (Walk the dogs)

What should he do second? (Get the dog food)

What should he do third? (Feed the dogs)

6. Raju asked Vivek if his father gave him enough pocket money for helping him look after the dogs. "Not really," said Vivek. "He gives me Rs 10 a day, and he's paid me that ever since I started helping him. I probably should ask for more pocket money."

"How long have you worked for him?" asked Raju.

"Five days," Vivek answered.

How much has Krishna Uncle given Vivek? (Rs 50/)

7. Parvathi Aunt was taking an airplane trip. She was going to Singapore. She was allowed to take only 20 kilograms of luggage on the plane. Parvathi Aunt piled all the clothes and other things she needed on a scale and found that they weighed exactly 20 kilograms. Then she got her old suitcase from the loft and put the things into it. When she arrived at the airport she had to put the suitcase on a scale there. "I'm afraid you're overweight," said the airline agent. "Your luggage weighs 23 kilograms."

What had Parvathi Aunt forgotten about? (The weight of her suitcase)

How much does her suitcase weigh when it is empty? (3kg)

8. Raju told Rashmi that the small five star bars were Rs 5/ each. "Here's a ten rupee note for one of them," she said.

How many five stars could Rashmi really buy for Rs 10/? (2)

9. Eleven of the children in Vivek's class have been sick all week. Two have colds, 4 are well to come back to school, and the rest have chikungunya.

How many children are still sick? (7)

10. Krishna Uncle has 7 dogs at the training school. He was able to teach 4 of them to walk on their hind legs. He can never teach stubborn dogs or fat dogs to do this.

Raju noticed that 2 of the dogs are fat. "You must have just 1 stubborn dog

here,” said quick thinking Rashmi.

“No,” said Krishna Uncle, “as it happens, 3 of these dogs are stubborn.”

How could that be? (The 2 fat dogs are also stubborn)

Level 3 Approximation

How Close Is Close Enough?

Rashmi always likes to figure everything out exactly, but Raju doesn’t mind using numbers that are close enough.

“My way is better,” said Raju, “because I get my answers quicker, and they are close enough. Besides, you sometimes make mistakes, and I never do.”

Whose way do you think is better: Rashmi’s way of always figuring things out exactly or Raju’s way of using numbers that are close enough?

Raju and Rashmi decided to keep track for a whole day and see whose way worked better. It was Saturday, and they had some shopping to do for their mother. They always went with their mother to do shopping; because their mother wanted them to learn about money she allowed them to figure things out for themselves while shopping. She told them to buy some lettuce, but not to spend more than Rs30/-. Lettuce cost Rs13.70 a head. They had to figure out how many heads of lettuce they could get without spending more than Rs30/-.

“Let’s see,” said Rashmi, “1370 paise and 1370 paise is I need a pencil for this one.”

“I already have the answer,” said Raju. “We can get 2 heads of lettuce and have a little less than Rs5/- left over.”

Is Raju right (Yes)

How could he have figured it out so quickly?

“How do you know?” Rashmi asked.

“Because,” he said, “Rs13.70 is almost Rs15/-, and 2 fifteens make 30, so we can buy only 2 heads of lettuce for Rs30/-. There will be a little less than Rs5/- left over, but that’s not enough for another head of lettuce.”

“Your way worked better that time,” said Rashmi, “but you were just lucky that Rs13.70 is close to Rs15/-. I didn’t notice that.”

Next their mother wanted them to buy some little glasses for orange juice. “We need 3 glasses,” their mother said, “don’t spend more than Rs100/-.”

Raju and Rashmi found just the kind they wanted, made of blue glass. They cost Rs37/- each.

“Oh, dear, I hope 3 of these don’t cost more than Rs100/,” Rashmi said.

“Don’t bother working it all out,” said Raju. “We can’t buy the glasses. Three of

them cost more than Rs100/."

Can you think of a way that Raju could have figured out quickly that the glasses cost more than Rs100/?

"How can you be sure?" Rashmi asked.

"Easy," said Raju. "Rs37/ is almost Rs40/, which is 400 tens paise. Four hundred tens and four hundred tens and four hundred tens make 1200 tens. That's Rs120/, which is quite a bit more than Rs100/."

The children looked around some more. At last they found some other glasses that were almost as good, and they cost Rs29/ apiece.

"Let's buy these," said Raju.

"Not so fast," Rashmi said, getting out her pencil. "We need to figure out exactly how much 3 of them cost and make sure it isn't more than Rs100/."

While Rashmi was busy adding Rs29/ and Rs29/ and Rs29/, Raju went up to the check-out counter and paid for the glasses.

Will the 3 glasses cost more or less than Rs100/? Try to figure it out Raju's way.

Raju came back with the package of glasses just as Rashmi finished adding. "I knew I was right," he said. "I figured that 29 is almost 30. Thirty and thirty and thirty make 90, so the 3 glasses would cost less than Rs90/. The Value Added Tax was Rs10.10 but even with that I still got back Rs2/

"Wait a minute," said Rashmi. "I've figured out that the 3 glasses should cost Rs87/. With Rs10.10 tax that should be Rs97.10. You didn't get the right amount of change."

If Rashmi is right, how much change should Raju have got?

"97.10 from 100 is 2.90," Rashmi said. "You should have got Rs2.90 back, and you got only Rs2/."

"I guess you're right," said Raju. He went back to the check-out counter and the man there said, "Oh, yes, I made a mistake," and gave him a 50 paise coin, a twenty five paise coin and a tamarind candy because he couldn't give another fifteen paise.

Why couldn't he pay them back fifteen paise?

"See," said Rashmi, "that proves it's important to figure out exactly how much things cost, even if it is more work and takes longer."

"You haven't proved it to me," said Raju. "All that work for just 90 paise! Rs2/ was close enough."

Which one do you agree with, Raju or Rashmi? Why?

Problems

1. Raghu Uncle needed 1 more leg for the stool he was making. To find out what length it should be, he measured the other 3 legs. One was 34 centimeters long, one was 35 centimeters long, and the other was 37 centimeters long.

Can you tell how long the fourth leg should be? (34 centimeters, because the other three legs can be cut shorter.)

2. When Vivek went to Venkatesh Uncle's toy shop, Venkatesh Uncle said, "These dart boards cost Rs99/ each, "so 2 of them will cost Rs299/. But as a special offer I'll take Rs10/ off, so they'll cost you only Rs289/."

What's wrong with Venkatesh Uncle's offer? (The normal price of 2 dart boards is Rs198/, so with the offer the price should be Rs188/)

3. Maya had Rs10/. She spent most of it.

Could she have Rs6.50/ left? (No)

Why not? (If she has spent most of it then she should have less than Rs5/ left)

4. A group of children were looking at a book that cost Rs80/.

"Let's each chip in Rs10/ and buy the book together," said Akash.

"That wouldn't work," said Rashmi. "If each of us gave Rs10/, we'd still only have half of the Rs80/ we need."

How many children are in the group? (4)

5. Vivek made a rectangle out of 8 toothpicks. One side of the rectangle was 3 times as long as another.

How many toothpicks were on the long side of the rectangle? (3)

6. Rashmi wrote a story that was 4 pages long. She wrote on both sides of the paper.

How many sheets of paper did the story cover? (2)

Another time she wrote a story that was 5 pages long.

How many sheets of paper did she need for it, if she used both sides? ($2\frac{1}{2}$)

7. "I wish I had 3 more marbles," said Akash. "Then I'd have as many as Maya." Maya has 38 marbles.

How many marbles does Akash have? (35)

8. "I wish I had 2 more rupees," said Akash. "Then I'd have enough money to buy 2 balloons." Balloons cost Rs3/ each.

How much money does Akash have? (Rs4/)

9. "I wish my little sister was 2 years older," said Akash. "Then she'd be as old as I am." Akash is 8 years old.

How old is his little sister? (6 years)

10. Rashmi said, "I wonder how far I will travel if I ride on this bus for an hour while it is going 35 kilometers an hour and then ride it for another hour while it is going 40 kilometers an hour."

How far will Rashmi travel? (75 kilometers)

If the bus goes only half as fast on the way back how long will the trip back take? (4hours)

How can you tell? (If the bus travels only half as fast then it will take twice as long to cover the same distance.)

Level 3 Division

A Sticky Problem

"Have you finished your model boat yet?" Rashmi asked.

"No," said Maya. "I've run into a problem. I have to cut this stick of wood into 5 equal pieces, and I don't know how to figure out how long they should be. We haven't learned that kind of thing yet at school."

"How long is the stick?" Vivek asked.

"I've never measured it," said Maya. "I didn't see how that would help."

How would measuring the stick help solve the problem?

Akash had a tape measure in his pocket, and with it he and Maya measured the stick of wood. It was 65 centimeters long. "That's no help," said Maya, "because I don't know how to divide 65 into 5 equal parts either."

While the children were walking along the pavement, thinking hard, they met Vinitha Aunty. "Are you having a problem?" she asked.

"A very hard problem," Raju said. "Maya has a stick 65 centimeters long, and we need to figure out how to divide it into 5 equal parts."

"My goodness, that is a hard problem," said Vinitha Aunty. "It's too bad the stick isn't 50 centimeters long isn't it?"

"Yes, it is," said Maya. "Then I would know exactly how long each of the 5 pieces should be."

How long would each of the pieces be if the stick were 50 centimetres long? (10)

"I know too," said Akash. "Each piece would be 10 centimeters long."

But my stick isn't 50 centimeters long," said Maya. "It's 65 centimeters, and I have to use all of it. If I made 5 pieces that were each 10 centimeters long, there would still be some left over."

"How much would be left over?" asked Vinitha Aunty.

Can you figure out the answer? (15 cm)

“There’d be 15 centimeters left over,” said Raju. “ $65 - 50$ is 15.”

“Ah, yes,” said Vinitha Aunty, “that’s quite a bit left over. I wonder what would happen if you tried to divide the leftover part into 5 equal pieces?”

How could you divide 15 centimeters into 5 equal parts?

“I know,” Rashmi said. “You’d get 5 pieces that are each 3 centimeters long. Is there any way to put those pieces together to get what we want?”

How could you put the pieces together to get the length Maya needs?

“You could use glue,” said Vivek. “You could take each of the 10-centimeter pieces and glue a 3-centimeter piece to one end of it. Then you’d have 5 pieces.”

“Would each piece be the same length?” Vinitha Aunty asked.

Would each piece be the same length? (Yes)

How do you know?

How long would each piece be?

“They’d all be the same length, which is what I want,” said Maya. “Each piece would be 13 centimeters long, and the whole stick would be used up. But it wouldn’t work. With so many parts glued together, the piece might be too weak.”

“That’s too bad,” said Vinitha Aunty. “I thought we had the problem solved. Is there any way we could do it without having to glue pieces of wood together?”

Can you think of a way?

“I have an idea,” said Rashmi. “We know that if we cut up the stick and then glue parts back together, we can get 5 sticks that are each 13 centimeters long, so why don’t we just cut 5 pieces that are 13 centimeters long in the first place? Then we won’t have to glue.”

“That sounds like a fine idea,” said Vinitha Aunty. “I wish I’d thought of it, but you children are very good at solving problems by yourselves.”

The children thanked her anyway and hurried over to Maya’s house to try out Rashmi’s idea. On the stick they marked off pieces that were exactly 13 centimeters long. Then Maya used a sharp knife to cut where they had marked. When she finished she had 5 pieces that were each the same length, and nothing was left over.

“I wish Vinitha Aunty was still here,” said Maya, “because I have another problem.”

“She isn’t much help anyway,” said Raju. “She never knows the answers. She just asks questions.”

Is it true that Vinitha Aunty wasn’t much help?

Why do you think so?

“My new problem,” said Maya, “is that I have this other stick that is 60

centimeters long. I need to cut it up into 5 equal parts too.”

“That’s easy,” said Raju, “I can solve that one with my eyes closed.” He thought and thought, and finally he said, “I think I’ll open my eyes.” None of the others knew how to solve the problem either.

What is it they need to figure out? (How long each piece should be)

“It’s too bad the stick isn’t 50 centimeters long,” said Vivek. “Then I’d know how long each of the 5 pieces should be.”

How long would each piece be if the stick were 50 centimeters long? (10 cm)

“Everybody knows that,” said Raju. “The pieces would be 10 centimeters long, because 5 times 10 is 50. But that’s no help, because the stick is 60 centimeters long.”

How much would be left if Maya cut off 5 pieces that were each 10 centimeters long? (10 cm)

“We have 10 centimeters left to worry about,” said Akash. Then he thought of something. “Hey,” he said, “this problem is almost the same as the first problem we solved! I think I can work it out now!”

Can you? Work on it today by yourself or with your friends. Find out tomorrow if you got it right. Remember, the problem is how to divide a stick 60 centimeters long into 5 equal pieces. (Encourage the children to keep working on the problem during the day or at home. Suggest that they ask questions like the kind Vinitha Aunty asked. The next day, check answers and methods and work through the problem in the style of Vinitha Aunty)

If the piece was 50 centimeters, how long would each of the 5 small pieces be? (10 cm)

How much would be left of the long piece? (10 cm)

If you divided that into 5 equal pieces, how long would each piece be? (2 cm)

Now, how could you put the small pieces together to make just 5 the same length? (By joining each 10 cm piece with a 2 cm piece)

So, in the end, how long should each piece be? (12 cm)

Note: If work on this problem seemed productive, you may wish to assign another problem for the next day; for instance, how to divide a 72 cm stick into 6 equal pieces.

Problems

1. Krishna Uncle wanted to mail a letter. He had an envelope that was 24 centimeters long and 10 centimeters wide. The letter measured 22 centimeters on one side and 25 centimeters on the other side.

How many folds does Krishna Uncle have to make in the letter to make it fit in the envelope? (2)

2. Krishna Uncle had an envelope that was 15 centimeters long and 9 centimeters wide. He had square piece of paper that was 16 centimeters on each side that he wanted to put in the envelope.

How many folds does Krishna Uncle have to put in the piece of paper to get it to fit in the envelope? (2)

3. Food World was selling a dozen glasses at one – fifth off the regular price because 6 of the glasses were broken.

Is this a very good bargain? (No)

Why not? (Because half the glasses are broken, and Food World wants more than half the regular price)

4. “Here’s a magic trick,” said Maya. “This box is 40 centimeters on each side. My magic wand is 50 centimeters long, but I can lay it in the bottom of the box without bending it.”

How could she do that? (By laying it diagonally)

5. Akash had a rectangular piece of paper that was 20 centimeters long and 10 centimeters wide. Akash said, “If I folded this paper in half I’ll get 2 squares.”

Is he right? (Yes)

How could he do that? (By folding the paper into half along the length)

6. Rashmi had a full glass of water; she drank half of it, then she added half as much water as she had left in the glass.

Now how much water does she have? (Three fourths of a glass)

7. Raghu Uncle had 12 tooth picks. He made a square out of 4 of the toothpicks. Then he wanted to change the square to a rectangle that would be 4 times as long as it was wide.

Does Raghu Uncle have enough toothpicks to do this? (Yes)

How many toothpicks does he have to use to make a rectangle that is 4 times as long as it is wide? (10)

8. Akash had a piece of cardboard that was 1 meter long. “All I can tell by using this piece of cardboard,” Akash said, “is that this table is longer than 1 meter and shorter than 2 meters.”

How many centimeters long could the table be? (any length from 101 to 199 cm)

9. Akash needed 4 sheets of coarse sandpaper to smooth off a tabletop. Now he wants to smooth off a tabletop that is just like the first one except that it is only half as wide and half as long.

How much coarse sand paper will he need? (1 sheet)

10. Both Vardenahalli and Magadi are to the east of Bangalore. Magadi is 10 kilometers east of Vardenahalli and Vardenahalli is 40 kilometers east of Bangalore.

Which 2 places are farthest apart? (Bangalore and Magadi)

How far apart are they? (50 kilometers)

Which 2 places are closest together? (Vardenahalli and Magadi)

How far apart are they? (10 kilometers)

Level 4

The Town of Kanaku: Part 1

On their way to the temple town of Madurai, Raju, Rashmi, Maya and Vivek suddenly stopped when they saw lush fields amongst huge rocks with a little town nestled in it. They were lured by the beauty of the place and wanted to explore. As they walked to the town, they saw a woman and a girl working in the fields.

“Hello, and welcome to Kanaku,” said the woman.

“Thank you,” said Rashmi. “How far is it to the nearest rock which has caves?”

“The nearest rock which has caves is about 10 kilometers from here,” said the girl. “That’s right,” said the woman. “It’s 43 kilometers from here.”

“Wait a minute,” said Vivek. “Something is wrong here.” Just then he saw an old man walking towards them. Vivek asked him, “Who is telling the truth about how far the nearest rock which has caves is?”

“They both are,” said the old man. “The nearest rock with caves is exactly 76 kilometers from here.” When he saw how puzzled the children were. The old man smiled.

“I guess you don’t know how we do things here in Kanaku,” he said. “We have a secret way of saying numbers. It protects us from spies. You children don’t look like spies. I’ll tell you the secret. Whenever we say a number we always add our age to it.”

“You mean,” Said Maya, “that if it was 2 o’clock, I’d say it was 11 o’clock, because I’m 9 years old?”

“That’s right,” said the old man, “I would say its 77 o’clock.”

1. If you wanted to find out if there were 2 schools in Kanaku, what number would you say instead?

2. If a 10 year old asked for 10 rupees, what would the child have to ask for?

3. An 8 year old in Kanaku says, “I have 12 people in my family.” How many people are really there?

4. How old is the old man?
5. How far is the nearest rock with caves?

The town of Kanaku: Part 2

Before going to explore the rocks, the children decided to get something to eat. They went into town to get something to eat. As they walked, they found a shop selling idlis.

“Give us 4 idlis,” Raju told the man.

“I’m not sure I can make so few idlis,” said the man.

“He’s right,” said Vivek. “One idli for each of us won’t be enough, let’s get three a person.”

“All right,” said Raju, “Please give us 12 idlis.”

“I think I know how many that is,” said the man. He gave them 4 idlis.

“Where are the others?” Raju asked.

“You ordered only 26, didn’t you?” the man said.

“I give up,” said Raju. “There’s no way you can get what you want over here.”

“Let me try,” said Maya. “You see how many idlis you have given us? Please give us that many again and then give us that many again.”

“I wish you children would make up your minds,” said the man. “Twenty-third you say 23 things and twenty-fourth you say something else!”

1. Why couldn’t the man give 4 idlis like Raju asked for?
2. How old was the man?
3. How would you say the last thing that the man said in our way, not the Kanaku way?
4. How old did the man think Raju was?

The town of Kanaku: Part 3

The four children came to a small school in the town and decided to visit it. Inside the school a mathematics class was going on. “Remember,” said the teacher, “Every triangle has 37 sides. What’s the rule Padma?”

“A triangle has 11 sides,” said a girl in the front row.

“That is correct. Now, how many sides does a square have?”

“A square has 13 sides,” said Padma.

“I’m afraid that is wrong,” said the teacher. “Nataraj, how many sides does a square have?”

“A square has 13 sides,” said Nataraj.

“That’s right,” said the teacher. “Now let’s welcome our 38 visitors.”

1. How could Padma be wrong when she said that a square has 13 sides and

Nataraj be right when he said the same thing?

2. What should Padma have said about the number of sides a square has?
3. How old is Padma?
4. How old is Nataraj?
5. How old is the teacher?
6. How old would Padma say Nataraj is and how old would Nataraj say Padma is? Why would they say the same number?

The town of Kanaku: Part 4

Raju, Rashmi, Maya and Vivek were finally ready to climb the rocks. Some of the children that they had met at the school had decided to go along with them. As they were walking, they saw some delicious jackfruit hanging from the tree. Raju's mouth watered at the thought of eating the sweet fruit. Just then, he saw a group of people who were cutting the fruit which they had just plucked from the tree.

Raju ran up to one man, "Will you give me some jackfruit?" he asked. "You need to pay for the jackfruit," said the man, "It will cost you Rs.46 for a piece."

"That's too much money" said Raju, "I can't pay that!"

"It's not too much," said an old man. "You should be happy to pay Rs.73 for such a fine fruit."

"That's right," said one of the boys who had come along with them. "Why, Rs.9 is not much, we all pay that."

"I can't figure out anything here", said Raju. "I want to leave."

"If you think things are bad here," said the man, "you should go to the little town, where they subtract their ages from all numbers!"

1. About how much does it really cost for a piece of jackfruit?
2. Could it cost Rs.1 a piece?
3. Could it cost more than Rs.10 a piece?

Level 5

Land: Part 1

"I wish we had a large farm so that I could ride horses," said Rashmi.

"We could have had one," said her mother, "if only your great-grandfather thought more about what he was doing. Many years ago he went out looking for free land. At one place they told him that he could have all the land he could walk around in a day. So he started just as the sun came up. He headed straight west as fast as he could go. At noon he turned around and headed straight back. He just made it to the starting point as the sun went down."

"Then he should have won a lot of land," said Raju. "Where is it?"

“You think the same way your great-grandfather did,” said his mother. “Now think a little harder. See if you can figure out what went wrong.”

“I think I know,” said Rashmi. “He should have walked in a crooked line both ways. Then he would have gotten a bigger piece of land.”

1. Draw a picture of the path that Rashmi and Raju’s great-grandfather followed.
2. How much land did he get?
3. What would their great-grandfather have won if he had used that path?
4. Draw some better paths that would have won more land.

Land: Part 2

“My grandfather tried to get some free land too,” said Parvathi Aunty. “He didn’t make the mistake of walking back and forth on the same line, but he made another mistake. He decided that he would walk south for half the day, and then east for 3 hours. Then he would walk straight to the starting point. He followed the plan exactly, but night came before he got to the starting point, so he didn’t get any land at all.”

“That is sad,” said Maya. “It was a good plan. If he had walked faster all day, it would have worked.”

1. Draw a picture showing the path that Parvathi aunty’s grandfather followed.
2. Suppose he walked faster, draw a picture of the path he would have followed then.
3. Why couldn’t his plan work, no matter how fast he walked? (Remember his plan and don’t change it!)
4. Suppose his plan worked. What shape is the piece of land he would have won?
5. How could he have changed his plan a little, so that it would have worked?

Land: Part 3

“Vivek’s great-grandfather had a chance for some free land, too,” said his mother. “He was very careful. He knew he had to make it back to the starting point by the time it became dark, otherwise he wouldn’t get anything. Maybe he was too careful.”

“How could he be too careful?” Vivek asked.

“Well, he started early in the morning and walked around in a little circle. He was back to the starting point in only ten minutes.”

“At least, he got some land!”

“Right,” said Vivek’s mother. “It was enough to park his horse-cart on. So he started off again in a bigger circle. This time it took him an hour to get back to the starting point.”

“That’s 2 pieces of land,” said Vivek.

“No, it was just 1,” said his mother. “But, he still had lots of time left so he walked another circle which took him 2 hours. Then he walked in a circle which took him 4 hours. He started on a still bigger circle, but night came before he made it back to the starting point.”

“So he didn’t get any land?” asked Maya.

“He got 4 pieces of land,” said Vivek.

“You’re both wrong,” said Vivek’s mother. “He got only 1 piece of land.”

1. How could Vivek’s great-grandfather walk in all those circles and still get only 1 piece of land?

2. Draw the picture of the path he followed.

3. Is there any way he could have gotten a different piece of land with each circle he walked around? Try to draw a path that would do this. (Remember, the starting point must always be the same place.)

Land: Part 4

My grandfather seems to have done better at getting free land,” said Krishna Uncle. “He planned everything just right. First he found out that he could walk only 48 kilometers in a day. Then he drew a map and followed it. He walked straight west for 23 kilometers. Then he walked south – I forget how far. Then he walked east. Then he walked straight north, back to the starting place. He got there just as the sun went down. He won a nice piece of land in the shape of a rectangle. I don’t know how large it was. I do remember, though, that he said he walked exactly 48 kilometers.”

Draw a picture of the land that Krishna uncle’s grandfather won. Put a number on each side to show how many kilometers long the side is.

1. How far is it around the land?

2. How many square kilometers is it?

3. How could he have gotten more land while still walking 48 kilometers?

Draw a picture to show how. Figure out how many square kilometers it would be.

4. Challenge: What is the most land he could have won by walking 48 kilometers? (he could have walked in any shape)

Circle Time

Suseela Kumaravel

A circle is the best shape that people can gather at as it allows for eye contact with everyone around. People come together in circles to discuss matters, to eat, to sing or to dance. In the circle time that we have, children and I get together to sing songs and recite poems with movement or gestures and to do story telling.

Every teacher in any part of the world, teaching in the pre-primary or primary sections without a shadow of doubt knows that songs, poems, movement, finger play and stories are enjoyed tremendously by children because these are very close to their hearts. I have no hesitation in adding that songs, stories and poems nourish their souls in ways that we cannot fathom. One visible effect that these have on the children is calming them down. In fact the only time children can become completely quiet and still is when they listen to a story that engages them completely. While doing craft of any kind children are often calm but seldom do I find them just working with their hands; they are busy chattering as well.

Children need to build up a vocabulary of a language through listening and speaking before they begin to read and write. It happens in a natural sort of way with the mother tongue. What better way than singing, reciting and listening to stories is there to learn a new language? Even when a child knows to speak a language stories, songs and poems help enhance their vocabulary.

In order to sing and recite with gestures the teacher needs to shed his/her inhibitions; for instance be able to leap like a frog or scamper like a rabbit with the children. We cannot do this unless there is joy in doing it. One doesn't have to be a great singer (I am not one, but I enjoy singing and listening to music). Simple tunes that are easy and repetitive can be chosen. I must add here that most of the repertoire that I have are not the usual nursery rhymes but quite unusual and many are related to nature and the seasons.

It is indeed fun to do circle time because it is one of those rare opportunities when a teacher can easily shed the didactic mode and switch over to a participatory mode. I definitely find it so. I don't ask the children to repeat after me, they do it with me.

Now coming to the actual circle time I do two sessions a week. I try and have a theme that coincides with what's happening in nature (it could be wind, rain, gardening etc) which I do for a month or so. There would be some poems and songs which are not connected to the theme, sometimes just to make it long enough

and at other times to make sure that there is a balance between poems that can be said loudly and those that need to be recited in a whisper (children love this variation and respond beautifully to variations of this nature as they do for speeding up and slowing down also). Talking about themes I am sure you would agree that what we did just now could fall under 'All Kinds of Legs and Walking'! You would have realized that some are done standing and some while sitting down. I like those poems that we do which help us stand or sit without the children being given instructions. One might say that we allow the poems to instruct us.

Once we have finished with all the jumping about we settle down to story telling. The story is often chosen to go with the theme and is initially told by me in parts. In the subsequent sessions the children recall the story; I make sure through gentle prodding that they incorporate the new words learnt. When they really know the story well they either illustrate a part of the story in their picture story book or act it out during circle time itself or use puppets to tell the story. (Puppets are sometimes made by them and sometimes by me). All the new nouns they learn are entered in their 'pictionary' with pictures and sentences. They also are encouraged to maintain their own word bank.

Over the years many other possibilities have been discovered. I have noticed that they are extremely alert after circle time so I happily capitalize on it and do a quick math and spelling revision. Teaching spelling and grammar through these poems and stories are being under taken.

The following three songs were composed by two students when they had moved out of Junior School; they shared these with us during circle time. Currently they are doing level 7 in CFL.

Beware

You are beautiful
Little flowers
Beware of
Walking people

You have a
Smell that's wonderful
Your petals
Are delicate.
Flowers! Beware of walking people

The Rain is Pouring

The rain is pouring (3)
The rain is pouring right now

The wind is blowing (3)
The wind is blowing right now

The clouds are moving (3)
The clouds are moving right now

The sun is glowing (3)
The sun is glowing right now

I am smiling (3)
I am smiling right now.

Nature Journal

Suseela Kumaravel

Being with nature is wonderful indeed for me. How can I convey this feeling to the children under my care? A child growing up in an urban environment often has very little contact with nature and can get lost in ways of consumerism, television, computer games or cell phone games. People who founded Centre for Learning along with those who joined them in the early years have created this haven where nature manifests itself in its utmost splendour. This rocky land terrain with its tree clusters, the many birds, all kinds of insects and wild flowering plants is indeed a treat to one's senses. We have realized that just making this space available to the children is not enough. Conscious efforts are needed to get the children in touch with that sense of contact with nature. This contact we feel is absolutely necessary for human beings to grow up with humane qualities. Fortunately the young children respond very well to these efforts of ours which shows that all is not lost.

If you have no relationship with nature you have no relationship with man. Nature is the meadows, the groves, the rivers, all the marvelous earth, the trees and the beauty of the earth. If we have no relationship with that, we shall have no relationship with each other.

J Krishnamurti

Through these words J Krishnamurti has poignantly conveyed the importance of a relationship between mankind and nature. I find that these words ring true and are very penetrating.

We at CFL are very fortunate to have this twenty two acre piece of land where nature can carry on its marvelous work largely uninterrupted and with minimum interference from mankind. So, we get to experience a range of colours in nature: the different greens of new leaves in spring, the array of all hues of bright colours in the wildflowers, the iridescent colours in butterflies birds and insects and the changing colours of a veiled chameleon. The spectacular sunsets and sunrises, colours of the rainbow, the water droplets shining like jewels on grass blade tips in the early mornings, the changing patterns of clouds in the sky looked at by lying flat on the rocks, a dry leaf floating down to the earth by a gentle breeze, a snake devouring a frog, a slender loris moving up a tree, munias tirelessly flying back and forth with one blade of grass in their beaks at a time to build their nests and many more such wonderful experiences await us each day.

The myriad ways in which the outer world can manifest itself are a special treat

to our senses. The fragrance of the Indian Cork tree flowers, the wonderful smell of the first rain on earth and many other rich aromas of nature are experienced with our sense of smell. The wind whistling its way through, the dry leaves rustled by a mongoose, babblers or a crow pheasant, the slender loris calling to each other in the night, the sound of children playing or a child crying, all these tell us what an intricate web nature is. Walking on the ground covered by leaves after the rains, working through the soil in the garden with our hands, feeling the texture of new leaves, soft petals of the wild flowers, or the rocks and stones are all indeed joyous experiences made possible because of our senses. If we are to allow our senses to respond to the varied stimuli offered by the natural world then we need to take time off from our busy schedules and in doing it we would find a great sense of contentment.

K T Margaret in her book “The Open Classroom” says:

The function of education is to correlate the inner self of the child with the outer world. Children should be given the time and space for their senses to experience and appreciate the outer world, so that their imagination is stimulated. They should be helped to use their sensory experiences to nourish their minds and hearts. Only then does education truly take place.

I completely resonate with her words. Walks and treks, making entries into a nature journal, having a nature table with all the natural treasures collected by children and nature related projects are all activities that provide children the space to get in touch with nature. When all the sensory stimuli can be accessed in nature I find that artificially contrived sensorial experiences are not necessary to keep the senses alive. What better way is there to stimulate the sense of hearing than listening to the bird calls and learning to identify birds without even seeing them? Nature is a patient, wonderful educator; all we need is the time to be with it.

Now coming to maintaining a nature journal – it seems the right kind of activity for the very young. Despite growing up in a city with all its distractions, they seem to have a fascination for the natural world – both the flora and the fauna. Often I find a child absorbed in observing a lizard, a spider, a butterfly, a bird, a wild flower or an ant. Thus in this activity they do what they naturally enjoy, i.e. observe, but of course while observing they make a record of their observations through a sketch and writing. While occupied in this manner their senses are alive and they calm down completely. Obviously questions follow their observations. They find the answers to their questions and in this manner make sense

of the world around them. In short they learn about all the creatures and the plants and the trees that they share their environment with. It's amazing how they capture the form of what they observe so well.

Usually, we go out to observe but occasionally opportunities come knocking at our door. Once a leaf insect came into the Junior School, and settled down very comfortably so we merrily abandoned everything else to observe, draw and write about it. After all it came to be with us and its visit had to be honoured. On the occasions when we found that a wolf snake was sharing our room we were not bold enough even after knowing its non poisonous nature, I wonder why now.

This is an activity that the teacher can do with the children, the children really get more involved when this happens and it is an enriching process for the teacher and the children. If as teachers, we read essays, stories and poems on nature, we would be able to assist and guide their work better. Hopefully, the relationship with nature thus formulated will help them do something as they become adults to protect their environment.

Some writings and pictures from the children's Journals

Rock Lizards

We saw four lizards. There were two adults and two babies. One baby was limping and one was the size of a peanut. The lizards had four legs and five fingers each. The lizards were black and orange in colour. The lizard's tail was long and curled up. Their eyes were small. One of the lizards was popping its head now and then. If anyone shouted it would run away. It would think she/he is going to harm it.

Student, 7 years

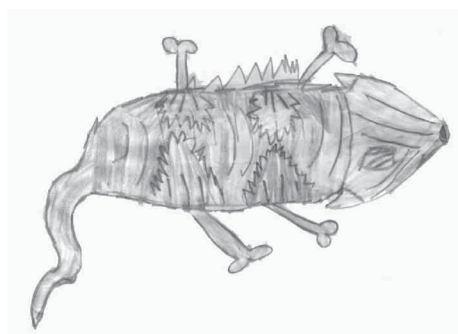
We were far from the lizards. There were three lizards. I don't know if it is a chameleon. The lizard was bright in colour. The tail was fat near the body and thin near the end and the head was big.

Student, 7 years



The lizard was on a granite slab. It had four legs and five fingers. It was black and red. It was changing colours. There were two baby lizards and two adult lizards. One baby lizard was limping. Nivedita shouted, "Shika! Shika!" and the lizard ran away. When it came back Nivedita, Shika, Abhin, Isbaan, Manini and I drew the lizard.

Student, 7 years



Leaf Insect

The leaf insect was like a leaf. It can get camouflaged in the neem leaf. And this is the first time that I saw a leaf insect. The leaf insect flew to the tiles on the thatch when Vimal uncle was teaching us foot ball. Before that we were in the Junior School and that time I saw the leaf insect. The leaf insect had small legs at the front and long legs at the back. The leaf insect was two inches long. Shreesha came close to the leaf insect and that is why it flew away.

Student 6 years

List of books

1. Teaching the trees Lessons from the Forest – Joan Maloof
2. The Song of the Mantis – Written and photographed by Peter Garland
3. Flower Fairies of the Summer – Cicely Mary Barker
4. Flower Fairies of the Trees – Cicely Mary Barker
5. Flower Fairies of the Winter – Cicely Mary Barker
6. Because of a Tree – Lorus J. Milne and Margery Milne
7. An Experiment in Education – Sybil Marshall
8. All the Marvelous Earth – J. Krishnamurti

The two poems included at the end here titled ‘When the Rain Kept Falling...’ and ‘Dragonfly’ were composed collectively by six to seven year-old children; each child made up a line.

When the Rain Kept Falling

When the rain kept falling, drip drop, drip drop,
Savandurga vanished from our view.

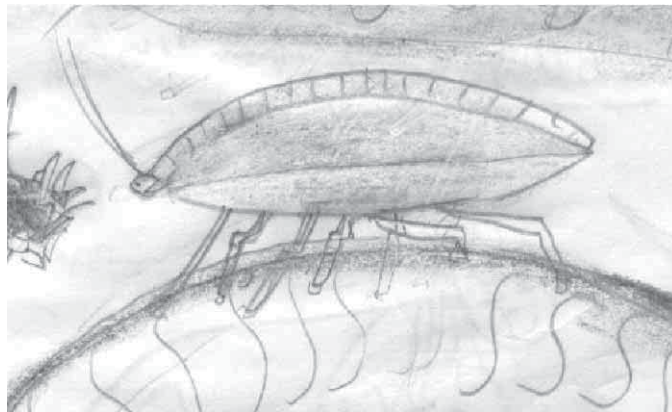
When the rain kept falling, drip drop, drip drop,
All the trees were swaying to and fro.

When the rain kept falling, drip drop, drip drop,

The grass and the shrubs and the mud got very wet.
When the rain kept falling, drip drop, drip drop,
We didn't get wet at all.
Would you like to know how?
We were sheltered in the temple.

Dragonfly

Dragonfly looks as if it is dancing
Rain comes and it hides
Amazing eyesight the dragonfly has
Gliding through the air like a helicopter
On a warm day it comes out
No one can see a dragonfly when it rains
Flitting after the flies and mosquitoes
Late in the evening it is still out
Yellowish orange it looks against the sun.



ಭಾಷಾ ಕಲಿಕೆ - ಕನ್ನಡ ಕಾರ್ಯಾಗಾರ

ಲೀಲಾ ಗರಡಿ ಮತ್ತು ಕಾವ್ಯ ಬಿರಾದಾರ

ಕನ್ನಡ ಕಲಿಕೆ

ಹೃದಯದ ಶ್ರೀಮಂತಿಕೆಯನ್ನು ಬೆಳೆಸುವುದೇ ನಿಜವಾದ ಶಿಕ್ಷಣ. ಇದು ಯಾವ ಭಾಷಾಮಾಧ್ಯಮದಿಂದಾದರೂ ಆಗಲು ಸಾಧ್ಯ. ಆದರೆ ಆ ಭಾಷೆ, ಕಲಿಯುವ ವ್ಯಕ್ತಿಯ ನೆಲದ ಭಾಷೆಯಾಗಿದ್ದಾಗ ಆತ ಸಮಾಜದೊಂದಿಗೆ ಬೆರೆಯಲು ಸಹಾಯಕವಾಗುತ್ತದೆ. ವ್ಯಕ್ತಿಯು ಒಂಟಿಯಾಗಿ ಬೆಳೆಯಲಾರ. ತಾನು ಬಾಳುವ ನೆಲ, ಸಮಾಜ, ಅದರ ಸಂಸ್ಕೃತಿ, ಅದರೊಂದಿಗೆ ತನ್ನ ಸಂಬಂಧ, ಅದರಿಂದ ತಾನು ಪಡೆದುದೇನು, ಆ ಸಂಸ್ಕೃತಿಯ ಆಧಾರ ಯಾವುದು, ಅದರ ಕುಂದುಕೊರತೆಗಳೇನು ಇತ್ಯಾದಿ ವಿಷಯಗಳನ್ನು ಅರಿತುಕೊಂಡರೆ ಉತ್ತಮವಾಗಿ ಬೆಳೆಯಲು ಸಾಧ್ಯ. ಒಂದು ಸಂಸ್ಕೃತಿಯ ಆಳವಾದ ತಿಳುವಳಿಕೆಯು ವ್ಯಕ್ತಿಯ ಹೃದಯದವನ್ನು ಶ್ರೀಮಂತಗೊಳಿಸಿ ಇಡೀ ಮಾನವ ಜನಾಂಗವನ್ನೇ ಅರಿಯಲು ಅನುವು ಮಾಡಿಕೊಡುತ್ತದೆ.

ಆಯಾ ನೆಲದ ಭಾಷೆ, ಅಲ್ಲಿಯ ಸಂಸ್ಕೃತಿಯನ್ನು ಬಿಂಬಿಸುತ್ತದೆ. ಒಂದು ಭಾಷೆಯನ್ನು ಸಾರ್ಥಕವಾಗಿ ಕಲಿಯಬೇಕಾದರೆ ಆ ಭಾಷೆಯನ್ನಾಡುವ ಜನರು ಬಾಳುತ್ತಿರುವ ಪರಿಸರದಲ್ಲಿ ವ್ಯವಹರಿಸಿ, ಕಲಿಯಬೇಕಾದದ್ದು ಸೂಕ್ತವೂ ಹೌದು, ಮತ್ತು ತನ್ನ ಸುತ್ತ ಮುತ್ತ ಜೀವಂತವಾಗಿರುವ ಭಾಷೆಯನ್ನು ಕಲಿಯುವುದು ಸುಲಭವೂ ಹೌದು. ಈ ಎಲ್ಲ ಕಾರಣಗಳು, ಕರ್ನಾಟಕದಲ್ಲಿ ಕನ್ನಡ ಕಲಿಯುವುದಕ್ಕೆ ಮಹತ್ವ ನೀಡುತ್ತವೆ. ಕನ್ನಡ ಭಾಷೆಗೆ ಎರಡು ಸಾವಿರ ವರ್ಷಗಳಿಗಿಂತಲೂ ಹೆಚ್ಚಿನ ಇತಿಹಾಸವಿದೆ. ಈ ಭಾಷೆ ಕನ್ನಡ ಜನಸಮುದಾಯದ ಜೀವನದ ರೀತಿ ನೀತಿ, ನೋವು ನಲಿವು, ನಂಬಿಕೆ ಶ್ರದ್ಧೆ, ಪ್ರಕೃತಿಯ ಜ್ಞಾನ, ಜೀವನ ದರ್ಶನ, ಕಲೆ ಇತ್ಯಾದಿಗಳನ್ನೆಲ್ಲ ತನ್ನಲ್ಲಿ ಗರ್ಭೀಕರಿಸಿಕೊಂಡಿದೆ. ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯುವುದು ಅಥವಾ ಅದರ ಸಂಸ್ಕೃತಿಯನ್ನು ಅರಿಯುವುದು ಎಂದರೆ ಇದನ್ನೆಲ್ಲ ಪ್ರತ್ಯಕ್ಷವಾಗಿಯೇ ಇಲ್ಲವೆ ಪರೋಕ್ಷವಾಗಿಯೇ ತಿಳಿದುಕೊಳ್ಳುವುದು ಎಂದಾಗುತ್ತದೆ.

ಆದರೆ ಈಗೀಗ ಕನ್ನಡ ಕಲಿಸಬೇಕಾದರೆ ಅನೇಕ ತೊಡಕುಗಳನ್ನು ಎದುರಿಸಬೇಕಾಗುತ್ತದೆ. ಏಕೆಂದರೆ ಮಕ್ಕಳು ಬೇರೆ ಬೇರೆ ಹಿನ್ನೆಲೆಗಳಿಂದ ಶಾಲೆಗೆ ಬರುತ್ತಾರೆ. ಅನೇಕ ಮಕ್ಕಳ ಮಾತೃ ಭಾಷೆ ಕನ್ನಡವಾಗಿರುವುದಿಲ್ಲ, ಅಥವಾ ಅದು ಕನ್ನಡವಾಗಿದ್ದರೂ ಮನೆ ಮಾತು ಇಂಗ್ಲೀಷೇ ಆಗಿರುತ್ತದೆ. ಇಲ್ಲವೆ ಅವರುಗಳ ಮನೆಯಲ್ಲಿ ಮಾತಾಡುವ ಕನ್ನಡದಲ್ಲಿ ಕೇವಲ ಸರ್ವನಾಮಗಳು ಮತ್ತು ಕ್ರಿಯಾಪದಗಳನ್ನು ಬಿಟ್ಟರೆ ಉಳಿದೆಲ್ಲವೂ ಇಂಗ್ಲೀಷಾಗಿರುತ್ತದೆ ಅಥವಾ ಪ್ರಾಂತೀಯ ಆಡು ಭಾಷೆಯಾಗಿರುತ್ತದೆ. ಇಂತಹ ಸಂದರ್ಭದಲ್ಲಿ ಕನ್ನಡ ಕಲಿಸುವುದು ಒಂದು ದೊಡ್ಡ ಸವಾಲಾಗಿ ಪರಿಣಮಿಸುತ್ತದೆ. ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕೇಳಿ ಮತ್ತು ಬಳಸಿ ಅಭ್ಯಾಸವಿಲ್ಲದ ಮಕ್ಕಳಿಗೆ ಅದು ಒಂದು ಹೊಸ ಭಾಷೆಯಾಗಿ, ಅದರ ವರ್ಣಮಾಲೆಯ ಹ್ರಸ್ವ, ದೀರ್ಘ, ಅಲ್ಪಪ್ರಾಣ, ಮಹಾಪ್ರಾಣ ಧ್ವನಿಗಳ ವ್ಯತ್ಯಾಸಗಳು ಗೊಂದಲವನ್ನುಂಟು ಮಾಡುತ್ತವೆ. ಅನೇಕ ವೇಳೆ ಅವರು ಕನ್ನಡದ ಪದಗಳನ್ನು ತಮ್ಮದೇ ಆದ ಧಾಟಿಯಲ್ಲಿ ಉಚ್ಚರಿಸುತ್ತಾರೆ. 'ಳ' ಕಾರಕ್ಕೆ ಬದಲಾಗಿ 'ಲ' ಕಾರವನ್ನು, 'ಊ' ಗೆ ಬದಲಾಗಿ 'ಹೂ' ವನ್ನು ಉಚ್ಚರಿಸಿದಾಗ ಉಂಟಾಗುವ ಆಭಾಸವನ್ನು ಇಲ್ಲಿ ಉಲ್ಲೇಖಿಸುವ ಅವಶ್ಯಕತೆ ಇಲ್ಲ. ವರ್ಣಮಾಲೆ, ಕಾಗುಣಿತ ಮತ್ತು ಒತ್ತಕ್ಷರಗಳನ್ನು ಪೂರ್ತಿಯಾಗಿ ಕಲಿಯಲು ಬಹಳ ಸಮಯ ಹಿಡಿಯುತ್ತದೆ. ಅಲ್ಲಿಯವರೆಗೆ ಅವರು ಏನನ್ನೂ ಓದಲಾರರು.

ಇದರಿಂದ ಮಕ್ಕಳಿಗೆ ಬೇಸರ ಉಂಟಾಗುತ್ತದೆ. ಕನ್ನಡದಲ್ಲಿ ಮೂರು ನಾಲ್ಕು ಪದಗಳು ಒಟ್ಟುಗೂಡಿ ಒಂದು ಪದವಾಗುವುದು ಸರ್ವೇಸಾಮಾನ್ಯ. ಇವುಗಳನ್ನು ಓದುವುದು ಒಂದು ಬಹು ದೊಡ್ಡ ತೊಡಕಾಗುತ್ತದೆ. ಅಡು ಭಾಷೆ ಮತ್ತು ಬರವಣಿಗೆಯ ಭಾಷೆಯಲ್ಲಿರುವ ವ್ಯತ್ಯಾಸ ಕೂಡ ಮಕ್ಕಳನ್ನು ಗೊಂದಲಕ್ಕೀಡುಮಾಡುತ್ತದೆ. ಇಂಗ್ಲೀಷಿನಲ್ಲಿ ಮಕ್ಕಳು ಬಹು ಬೇಗ ಓದಬಲ್ಲರು. ಏಕೆಂದರೆ ಅಲ್ಲಿ ಎಲ್ಲ ಮಟ್ಟದಲ್ಲೂ ಆಕರ್ಷಕವಾದ ಅನೇಕ ಪುಸ್ತಕಗಳು ಬಹು ಸುಲಭವಾಗಿ ದೊರೆಯುತ್ತವೆ. ಆದರೆ ಕನ್ನಡದಲ್ಲಿ ಆ ರೀತಿಯ ಪುಸ್ತಕಗಳು ಇಲ್ಲ. ನಮ್ಮಲ್ಲಿ ಮಕ್ಕಳಿಗಾಗಿ ಸಿಗುವ ಪುಸ್ತಕದ ಭಾಷೆ ಕಠಿಣವಾಗಿರುತ್ತದೆ. ಸಂಸ್ಕೃತಿ ಬದಲಾಗಿರುವುದರಿಂದ ಪರಂಪರಾಗತ ಕತೆಗಳನ್ನು ಎಲ್ಲ ಮಕ್ಕಳು ಅರ್ಥ ಮಾಡಿಕೊಳ್ಳುವುದು ಕಷ್ಟ. ಇಂದಿನ ಸಂಸ್ಕೃತಿಗೆ ತಕ್ಕಂತಹ ಕತೆಗಳನ್ನು ಬರೆದಾಗ ಹೆಚ್ಚಿನ ಆಂಗ್ಲ ಪದಗಳ ಬಳಕೆಯಾಗುತ್ತದೆ. ಅವುಗಳನ್ನು ಕನ್ನಡದಲ್ಲಿ ಓದುವುದು ಕಷ್ಟಕರವಾಗುತ್ತದೆ. ಮಕ್ಕಳು ಕನ್ನಡ ಕಲಿಕೆಯಲ್ಲಿ ಆಸಕ್ತಿಯನ್ನು ಕಳೆದುಕೊಳ್ಳುವುದಕ್ಕೆ ಈ ಎಲ್ಲ ವಿಷಯಗಳು ಕಾರಣವಾಗುತ್ತವೆ. ಸಮಾಜದಲ್ಲಿಯೂ ಕನ್ನಡದ ಬಳಕೆ ದಿನೇ ದಿನೇ ಕಡಿಮೆಯಾಗುತ್ತಿರುವುದರಿಂದ ಮಕ್ಕಳು ಕನ್ನಡದ ಬಗ್ಗೆ ಅಸಡ್ಡೆ ತೋರಿದರೂ ಆಶ್ಚರ್ಯವಿಲ್ಲ. ಹೀಗೆಂದು ಯಾರೂ ಕೈಚೆಲ್ಲಿ ಕುಳಿತಿರಬೇಕಾಗಿಲ್ಲ. ಸಮಸ್ಯೆ ಇದ್ದಲ್ಲಿ ಪರಿಹಾರವೂ ಇದ್ದೇ ಇರುತ್ತದೆ. ಈ ಎಲ್ಲ ವಿಷಯಗಳನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ನಾವು ಕನ್ನಡ ಕಲಿಸುವ ವಿಧಾನವನ್ನು ಪರಿಸ್ಥಿತಿಗೆ ತಕ್ಕಂತೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕಾಗುತ್ತದೆ.

ಕಲಿಕೆ ಮುಖ್ಯವಾಗಿ - ಕಲಿಯುವವ, ಕಲಿಸುವವ ಮತ್ತು ಕಲಿಯತಕ್ಕ ವಿಷಯ, ಇವು ಮೂರನ್ನು ಒಳಗೊಂಡಿರುತ್ತದೆ. ಈಗ ನಾವು ಸಂಪೂರ್ಣವಾಗಿ ಕಡೆಗಣಿಸಿದರೂ, ಮತ್ತು ನಮಗೆ ಅಮುಖ್ಯವಾಗಿ ತೋರಿದರೂ, ಅಷ್ಟೇ ಮುಖ್ಯವಾಗಿರುವ ಇನ್ನೆರಡು ವಿಷಯಗಳೂ ಇವೆ. ಅವು- ಮನೆಯ ಪರಿಸರ, ಅಂದರೆ, ಪೋಷಕರ ದೃಷ್ಟಿ ಮತ್ತು ಸಮಾಜ. ಈ ಎಲ್ಲವುಗಳಲ್ಲಿ ಒಳ್ಳೆಯ ಹೊಂದಾಣಿಕೆ ಇದ್ದಲ್ಲಿ ಮಾತ್ರ ಕಲಿಕೆ ಸಾರ್ಥಕವಾಗುತ್ತದೆ. ಈ ಮಾತು ಭಾಷಾಕಲಿಕೆಯಲ್ಲಿ ಇನ್ನೂ ಹೆಚ್ಚಿನ ಮಹತ್ವ ಪಡೆಯುತ್ತದೆ. ಏಕೆಂದರೆ, ಇಂದು, ಕಂಪ್ಯೂಟರ್ ವಿಜ್ಞಾನ, ಇಂಗ್ಲೀಷು, ತಂತ್ರಜ್ಞಾನ ಮುಂತಾದವುಗಳು ಸಮಾಜದಲ್ಲಿ ಅತಿಯಾದ ಮಹತ್ವ ಪಡೆದಿವೆ. ಕನ್ನಡ ಯಾರಿಗೂ ಬೇಡದ ಭಾಷೆಯಾಗಿ ಉಳಿದಿದೆ. ಮೊಟ್ಟ ಮೊದಲು ದೊಡ್ಡವರಾದವರು ಈ ಭಾಷೆಯ ಮಹತ್ವವೇನು ಎಂಬುದನ್ನು ಚೆನ್ನಾಗಿ ಮನವರಿಕೆ ಮಾಡಿ ಕೊಳ್ಳಬೇಕು. ತನ್ನ ಮಗು ಕಂಪ್ಯೂಟರ್ ವಿಜ್ಞಾನ, ಇಂಗ್ಲೀಷು, ಗಣಿತಗಳನ್ನು ಕಲಿಯಲಿ ಎಂದು ಹಲವಾರು ಉಪಾಯಗಳನ್ನು ಮಾಡುವ ಪೋಷಕರು, ತಮ್ಮ ಭಾಷೆಯನ್ನು ಕಲಿಸಲು ಯಾವುದೇ ಸಕ್ರಿಯ ಪ್ರಯತ್ನವೇಕೆ ಮಾಡುತ್ತಿಲ್ಲ ಎಂದು ತಮ್ಮನ್ನು ತಾವೇ ಗಂಭೀರವಾಗಿ ಪ್ರಶ್ನಿಸುವ ಕಾಲ ಬಂದಿದೆ. ಅವರು, ಅದು ಮಾತ್ರ ಭಾಷೆಯಾಗಿರುವುದರಿಂದ ತಾನಾಗಿಯೇ ಬರುತ್ತದೆ ಎನ್ನುವ ತಪ್ಪು ತಿಳುವಳಿಕೆಯಲ್ಲಿರುವಂತಿದೆ. ಮಗುವಿನಲ್ಲಿ ಕಲಿಯಬೇಕೆಂಬ ಆಸಕ್ತಿ ಮತ್ತು ಕಲಿಯುವ ಸಾಮರ್ಥ್ಯ ಸ್ವಾಭಾವಿಕವಾಗಿಯೇ ಇರುತ್ತದೆ. ಈ ಸಹಜವಾದ ಗುಣವನ್ನು ಹಿರಿಯರೆಲ್ಲರೂ ಪೋಷಿಸಿಕೊಂಡು ಬರುವುದು ಮುಖ್ಯ. ಅಧ್ಯಾಪಕ ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಯ ನಡುವೆ ಪ್ರೀತಿ ಮತ್ತು ವಿಶ್ವಾಸದ ಸಂಬಂಧವಿರಬೇಕೇ ಹೊರತು ಅಧಿಕಾರ ಮತ್ತು ವಿಧೇಯತೆಯದಲ್ಲ. ಹಿರಿಯರ ಆತ್ಮೀಯ ಸಂಬಂಧ ಮಕ್ಕಳಲ್ಲಿ ಆತ್ಮವಿಶ್ವಾಸ, ಉತ್ಸಾಹ, ಸ್ವಂತ ಬುದ್ಧಿ ಮತ್ತು ಪ್ರೀತಿಯನ್ನು ಬೆಳೆಸುತ್ತದೆ.

ಇನ್ನು ಕಲಿಯತಕ್ಕ ವಿಷಯ: ಅದು ಮಗುವಿನ ಮಾನಸಿಕ ಮಟ್ಟಕ್ಕೆ ಅನುಗುಣವಾಗಿದ್ದು

ಕುತೂಹಲಕಾರಿಯಾಗಿದ್ದು ಮಗುವಿನ ಬೆಳೆವಣಿಗೆಗೆ ಪೂರಕವಾಗಿರಬೇಕು. ಆ ವಿಷಯದಲ್ಲಿ ಮುಕ್ತ ಚರ್ಚೆಗೆ ಅವಕಾಶವಿರಬೇಕು. ಮಗು ಕಲಿಯುತ್ತಿರುವ ವಿಷಯದಲ್ಲಿ ಪೋಷಕರಿಗೆ ಆಸಕ್ತಿ ಇದ್ದು ಅದನ್ನು ಅವರು ಮಗುವಿನೊಂದಿಗೆ ಹಂಚಿಕೊಂಡರೆ, ಮತ್ತು ಸಮಾಜದಲ್ಲಿ ಅದು ಜೀವಂತವಾಗಿದ್ದರೆ ಮಗುವಿನ ಕಲಿಕೆ ಸಮೃದ್ಧವಾಗುವುದರಲ್ಲಿ ಅನುಮಾನವೇ ಇಲ್ಲ.

ಭಾಷೆ ಕೇವಲ ಪಠ್ಯ ಪುಸ್ತಕ ಮತ್ತು ತರಗತಿಗೆ ಸೀಮಿತವಾಗಿರಕೂಡದು. ಅದು ಜೀವಂತವಾಗಬೇಕಾದರೆ ಹಾಡುಗಳನ್ನು ಕಲಿಯಲು, ಕತೆಗಳನ್ನು ಕೇಳಲು, ಮಾತನಾಡಲು, ನಾಟಕಗಳನ್ನು ನೋಡಲು, ಆಡಲು, ಅಧ್ಯಾಪಕನು ತನಗೆ ಪ್ರಿಯವಾದ ಕತೆ, ಕವಿತೆ, ಹಾಡು, ಅನುಭವಗಳನ್ನು ಹಂಚಿಕೊಳ್ಳಲು ಅವಕಾಶಗಳನ್ನು ಕಲ್ಪಿಸುವುದು ಬಹಳ ಮುಖ್ಯ.

ಮೇಲೆ ವಿವರಿಸಿದ ಎಲ್ಲ ಅಂಶಗಳನ್ನು ಗಮನದಲ್ಲಿರಿಸಿಕೊಂಡು ನಮ್ಮ ಶಾಲೆಯ ಪಠ್ಯಕ್ರಮವನ್ನು ರೂಪಿಸುವ ಪ್ರಯತ್ನ ಮಾಡಲಾಗಿದೆ. ಅದರ ಸಂಕ್ಷಿಪ್ತ ಪರಿಚಯ ಈ ಕೆಳಗೆ ಕೊಡಲಾಗಿದೆ.

ಕನ್ನಡವು ಹೆಚ್ಚು ಹೆಚ್ಚಾಗಿ ಕಿವಿಯ ಮೇಲೆ ಬಿದ್ದು ಅದರ ಬಳಕೆಯಲ್ಲಿ ಸಹಾಯವಾಗಲಿ ಎಂಬ ಉದ್ದೇಶದಿಂದ ಸಂಭಾಷಣೆ, ಕತೆ, ಹಾಡು ಮತ್ತು ನಾಟಕಗಳ ಮೂಲಕ ಕನ್ನಡದ ಕಲಿಕೆ ಆರಂಭವಾಗುತ್ತದೆ. ಕನ್ನಡದ ಪದ್ಯಗಳನ್ನು ಸ್ಪಷ್ಟ ಉಚ್ಚಾರಣೆಯೊಂದಿಗೆ ಲಯಬದ್ಧವಾಗಿ ಹೇಳುವ ಅಭ್ಯಾಸ ಮಾಡಿಸಲಾಗುತ್ತದೆ. ವರ್ಣಮಾಲೆಯ ಬದಲಿಗೆ ಚಿತ್ರಗಳೊಂದಿಗೆ ಸುಲಭವಾದ ಪದಗಳ ಮೂಲಕ ಕನ್ನಡದ ಓದು ಬರಹ ಹೇಳಿಕೊಡಲಾಗುತ್ತದೆ. ಹೀಗೆ ಮಾಡುವುದರಿಂದ ಮಗು ಸಣ್ಣ ಸಣ್ಣ ವಾಕ್ಯಗಳನ್ನು ಓದಲು ಮತ್ತು ಬರೆಯಲು, ಕನ್ನಡದ ಎಲ್ಲ ಅಕ್ಷರ, ಕಾಗುಣಿತ ಮತ್ತು ಒತ್ತಕ್ಷರಗಳನ್ನು ಕಲಿಯುವವರೆಗೆ ಕಾಯಬೇಕಾಗಿಲ್ಲ. ಏಕೆಂದರೆ ಹೆಚ್ಚಾಗಿ ಬಳಸುವ ಪದಗಳನ್ನು, ಕಾಗುಣಿತ ಮತ್ತು ಒತ್ತಕ್ಷರಗಳನ್ನು ಮಾತ್ರ ಮೊದಲು ಹೇಳಿಕೊಡಲಾಗುತ್ತದೆ. ಸುಮಾರು ಇಪ್ಪತ್ತೊಂಬತ್ತು ಪಾಠಗಳನ್ನು (ಇವುಗಳನ್ನು ಪಾಠಗಳೆನ್ನುವುದಕ್ಕಿಂತ ವರ್ಕ್ ಶೀಟ್ ಎನ್ನುವುದೇ ಹೆಚ್ಚು ಸೂಕ್ತ. ಏಕೆಂದರೆ ಇಲ್ಲಿ ಕೇವಲ ಎರಡು ಅಥವಾ ಮೂರು ಚಿತ್ರಗಳು, ಪದಗಳು ಮತ್ತು ಅವುಗಳ ಬರೆಯುವ ಅಭ್ಯಾಸ, ಇಷ್ಟು ಮಾತ್ರ ಇವೆ.) ಕಲಿತ ಕೂಡಲೆ ಸಣ್ಣ ಸಣ್ಣ ವಾಕ್ಯಗಳಿರುವ ಚಿತ್ರಕಥೆಗಳನ್ನು ಓದಬಲ್ಲ ಸಂತಸ ಮಕ್ಕಳದಾಗುತ್ತದೆ. ಅವರಿಗೆ ಭಾಷೆಯ ಸಾಮಾನ್ಯ ತಿಳುವಳಿಕೆಯುಂಟಾಗಿರುತ್ತದೆ. ಅವರ ಕಲಿಕೆಯ ಮಟ್ಟಕ್ಕೆ ಅನುಗುಣವಾಗಿ ಪಠ್ಯವನ್ನು ಸೃಷ್ಟಿಸಿ ಕೊಡಲಾಗುತ್ತದೆ. ಪೂರಕವಾಗಿ ಇತರ ಪಠ್ಯ ಪುಸ್ತಕಗಳನ್ನೂ (ಓದುವ ಆಟ, ಕಲಿ ನಲಿ ಇತ್ಯಾದಿ) ಬಳಸಿಕೊಳ್ಳಲಾಗುತ್ತದೆ. ಕಲಿಕೆಯ ಪ್ರತಿ ಹಂತದಲ್ಲಿಯೂ ಸಂಭಾಷಣೆ, ಹಾಡು, ಕತೆ, ನಾಟಕಗಳು ಇದ್ದೇ ಇರುತ್ತವೆ.

ಒಂದು ಶೈಕ್ಷಣಿಕ ವರ್ಷದಲ್ಲಿ ಇಂತಿಷ್ಟು ಪಾಠಗಳನ್ನು ಮಾಡಿ ಮುಗಿಸಬೇಕೆನ್ನುವುದಕ್ಕಿಂತ ಇಂತಿಂತಹ ಕೌಶಲಗಳನ್ನು ಕಲಿಸಬೇಕೆಂಬ ಉದ್ದೇಶ ಹೊಂದುವುದು ಸೂಕ್ತ. ಒಂದು ಪಠ್ಯ ಪುಸ್ತಕದಲ್ಲಿ ಅನೇಕ ವಿಷಯಗಳ ಬಗ್ಗೆ ಬಿಡಿ ಬಿಡಿಯಾದ ಲೇಖನಗಳಿರುತ್ತವೆ. ಸಮಯದ ಅಭಾವದಿಂದ ಅವುಗಳ ಹಿಂದು ಮುಂದಿನ ಸಂದರ್ಭಗಳನ್ನು ತಿಳಿಸದೆ, ಜೀವನದಿಂದ ಪ್ರತ್ಯೇಕಗೊಳಿಸಿ, ಕೇವಲ ಒಂದು ಬಿಡಿಯಾದ ಪಾಠದಂತೆ ಹೇಳಿಕೊಟ್ಟಾಗ ಅದು ಮಗುವಿಗೆ ಅತ್ಯಂತ ನೀರಸವಾದ, ಯಾವ ಅರ್ಥವೂ ಕೊಡದ, ಆದರೆ ತಾನು ಮಾಡಿ ಮುಗಿಸಲೇ ಬೇಕಾದ ಕಠಿಣ ಕೆಲಸವಾಗುತ್ತದೆ. ಆದ್ದರಿಂದ ನಾವು ಈ ಪದ್ಧತಿಯನ್ನು

ಕೈಬಿಟ್ಟು, ಆಯಾ ಮಕ್ಕಳ ವಯಸ್ಸು, ಆಸಕ್ತಿ, ಸಾಮರ್ಥ್ಯ ಮತ್ತು ಸಂದರ್ಭವನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ವಿಷಯಗಳನ್ನಾರಿಸಿ ಅವುಗಳಬಗ್ಗೆ ಪರಿಯೋಜನೆಗಳನ್ನು (ಪ್ರಾಜೆಕ್ಟ್) ಗಳನ್ನು ಮಾಡುವುದು ಔಚಿತ್ಯಪೂರ್ಣವಾದುದೆಂದರಿತು ಹಾಗೆ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಇಲ್ಲಿ ಕೇಂದ್ರ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ, ಸಂದರ್ಭಕ್ಕೆ ತಕ್ಕಂತೆ, ಇತರ ಅನೇಕ ವಿಷಯಗಳನ್ನು ಅಳವಡಿಸಿ ಪರಿಯೋಜನೆಯನ್ನು ರೂಪಿಸಲಾಗುತ್ತದೆ. ಮಕ್ಕಳೇ ಸ್ವತಃ ಚರ್ಚಿಸಿ ಇಲ್ಲವೆ ಓದಿ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಳ್ಳುವಂತೆ ಮಾಡಲಾಗುತ್ತದೆ. ಆದ್ದರಿಂದ ಇದು ಅವರಿಗೆ ಅರ್ಥಪೂರ್ಣವೆನಿಸುತ್ತದೆ. ಅಲ್ಲದೆ ಅವರಲ್ಲಿ ಉತ್ಸಾಹ ತುಂಬುತ್ತದೆ. ಪರಿಯೋಜನೆಯ ಪದ್ಧತಿಯಲ್ಲಿ ಅನೇಕ ಲಾಭಗಳಿವೆ. ಇಲ್ಲಿ ಚರ್ಚೆಗೆ ಹೆಚ್ಚು ಅವಕಾಶವಿರುವುದರಿಂದ ಬೇರೆ ಬೇರೆ ಮಟ್ಟದಲ್ಲಿರುವ ಮಕ್ಕಳಿಗೂ ಇದು ಬೇಸರ ಹುಟ್ಟಿಸುವುದಿಲ್ಲ. ಎಲ್ಲರಿಗೂ ಮಾತಾಡಲು ಅವಕಾಶ ಸಿಗುತ್ತದೆ. ಇದರಿಂದ ಮಗುವಿನ ಆತ್ಮವಿಶ್ವಾಸ ಬೆಳೆದು ತನ್ನನ್ನು ತಿದ್ದಿಕೊಳ್ಳುವ ಪ್ರಯತ್ನ ಮಾಡುತ್ತದೆ. ಒಂದು ತರಗತಿಯಲ್ಲಿ ಎಲ್ಲ ಮಕ್ಕಳ ಕಲಿಕಾಮಟ್ಟ ಒಂದೇ ಇರುವುದಿಲ್ಲ. ಎಲ್ಲರೂ ಒಂದೇ ಮಟ್ಟದಲ್ಲಿ ಕಲಿಯಬೇಕೆಂದು ನಿರೀಕ್ಷಿಸುವುದೂ ಸರಿಯಲ್ಲ. ಆದ್ದರಿಂದ ಪಠ್ಯವನ್ನು ಅವರವರ ಮಟ್ಟಕ್ಕೆ ತಕ್ಕಂತೆ ರೂಪಿಸಲು ಅವಕಾಶವಿರುತ್ತದೆ. ಇಂತಹ ಪರಿಯೋಜನೆಗಳ ಮುಖಾಂತರ ಕರ್ನಾಟಕದ ಇತಿಹಾಸ, ಸಂಸ್ಕೃತಿ, ಭೂಗೋಳ ಮತ್ತು ಅನೇಕ ಇತರ ವಿಷಯಗಳನ್ನು ಹೆಣೆಯುವಲ್ಲಿ ನಮಗೆ ಯಶಸ್ಸು ಸಿಕ್ಕಿದೆ ಎಂದು ಹೇಳಬಹುದು. ಅವುಗಳನ್ನು ಅರ್ಥಪೂರ್ಣಗೊಳಿಸಲು ಹಂಪಿ, ಹಳೇಬೀಡು, ಶ್ರವಣಬೆಳಗೊಳ ಮುಂತಾದ ಸ್ಥಳಗಳನ್ನು ಮಕ್ಕಳು ಸಂದರ್ಶಿಸಿದ್ದಾರೆ. ಇನ್ನೊಂದು ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪಕ್ಕದ ವರದೇನ ಹಳ್ಳಿಗೂ ಹೋಗಿ ರೈತರನ್ನು, ಗೊಲ್ಲರನ್ನು ಸಂದರ್ಶಿಸಿ ಅನೇಕ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಳ್ಳಲು ಅವಕಾಶಮಾಡಿಕೊಟ್ಟಿದೆ.

ಪರಿಯೋಜನೆಗಳ ಜೊತೆಗೆಯೇ ಪ್ರಸಿದ್ಧ ಬರಹಗಾರರ ಕತೆ, ಕವಿತೆ, ಗದ್ಯ ರಚನೆಗಳನ್ನೂ ಸಹ ಪರಿಚಯಿಸಲಾಗುತ್ತದೆ. ಇದರೊಂದಿಗೆ ಮಕ್ಕಳು, ಪ್ರತಿ ಹಂತದಲ್ಲಿಯೂ ಕಲಿಯಬೇಕಾದ ಸಾಮಾನ್ಯ ಭಾಷಾ ಕೌಶಲಗಳ ಕಲಿಕೆಯನ್ನು ಅಳವಡಿಸಲಾಗುತ್ತದೆ. ಆರು ವರ್ಷ ವಯಸ್ಸಿನಿಂದ ಹದಿಮೂರು ವರ್ಷ ವಯಸ್ಸಿನ ವರೆಗೂ ಮಕ್ಕಳಿಗೆ ಕನ್ನಡವನ್ನು ಕಡ್ಡಾಯವಾಗಿ ಹೇಳಿಕೊಡಲಾಗುತ್ತಿದೆ. ಒಟ್ಟಿನಲ್ಲಿ ಕನ್ನಡ ಕಲಿಕೆ ಹೆಚ್ಚು ಅರ್ಥಪೂರ್ಣವಾಗುವಂತೆ ಮಾಡಲು ನಮಗೆ ತಿಳಿದ ಎಲ್ಲ ಪ್ರಯತ್ನಗಳನ್ನು ನಮ್ಮ ಮಿತಿಯಲ್ಲಿ, ನಮ್ಮ ಸಾಮರ್ಥ್ಯಕ್ಕೆ ತಕ್ಕಂತೆ ಮಾಡುತ್ತಿದ್ದೇವೆ.

ಮಕ್ಕಳಿಗೆ ಪದ್ಯಗಳು

ಮಕ್ಕಳು ಹುಟ್ಟಿನಿಂದ ಹಾಡನ್ನು ಕೇಳಿ ಸವಿಯುವುದನ್ನು ನಾವು ಪ್ರಪಂಚದಾದ್ಯಂತ ನೋಡುತ್ತೇವೆ. ತಾಯಿ ಜೋಗುಳ ಹಾಡಿ ಮಲಗಿಸುವ ಸಂಪ್ರದಾಯ ಎಲ್ಲ ಜನಾಂಗದಲ್ಲೂ ಕಂಡು ಬರುತ್ತದೆ. ಜೋಗುಳದ ಅರ್ಥ ಮಗುವಿಗೆ ಆಯಿತೆ ಇಲ್ಲವೆ ಎನ್ನುವುದು ಮುಖ್ಯವಲ್ಲ. ಅದರ ಆಶಯ, ಪದಗಳ ಲಾಲಿತ್ಯ, ರಾಗ ಸಂಯೋಜನೆ, ಪ್ರಾಸಬದ್ಧ ಪದಗಳು, ಲಯ ಮತ್ತು ಹಾಡುವವರ ಆಶಯ ಇವುಗಳ ಅನುಭವ ಎಲ್ಲರಿಗೂ ಆಗುತ್ತದೆ. ಇದಕ್ಕಾಗಿ ಬುದ್ಧಿ ಬೆಳೆದವರೇ ಆಗಬೇಕು ಅಥವಾ ಭಾಷೆ ತಿಳಿದವರೇ ಆಗಬೇಕು ಎಂದೇನಿಲ್ಲ.

ಈ ಜೋಗುಳದ ಪದ್ಧತಿ ಇದ್ದರೂ ಅದು ಹೆಚ್ಚು ಕಾಲ ಮುಂದುವರಿಯುವುದಿಲ್ಲ. ಮುಂದೆ ಆ ಸ್ಥಳವನ್ನು ಟಿ.ವಿ., ರೇಡಿಯೋ, ಕಂಪ್ಯೂಟರ್ ಗಳು ಆವರಿಸಿಕೊಳ್ಳುತ್ತವೆ. ಈ ಮಾಧ್ಯಮಗಳಲ್ಲಿ ಬರುವ ಕಾರ್ಯಕ್ರಮಗಳ ಅರ್ಥ, ಆಶಯ, ಭಾಷೆ ಮತ್ತು ಅವುಗಳ ಪರಿಣಾಮ, ಎಳೆವಯಸ್ಸಿನ ಮಕ್ಕಳ ಮನಸ್ಸಿನ ಮೇಲೆ ಏನಾಗಬಹುದೆಂಬುದನ್ನು ನೀವೇ ಯೋಚಿಸಿ ನೋಡಿ.

ಹಿಂದೆ ನಮ್ಮ ಸಾಮಾಜಿಕ ಸಂಸ್ಕೃತಿಯಲ್ಲಿ ಜಾನಪದ ಹಾಡುಗಳು, ಪುರಾಣ ಪ್ರವಚನಗಳು, ಬಯಲಾಟಗಳು, ಯಕ್ಷಗಾನಗಳು ಇತ್ಯಾದಿ, ಹಾಸುಹೊಕ್ಕಾಗಿ ಸೇರಿಕೊಂಡಿದ್ದರಿಂದ, ಭಾಷೆಯ ಸೌಂದರ್ಯದ, ಲಯತಾಳಗಳ, ಗಂಭೀರ ವಿಷಯಗಳ ಮತ್ತು ಮೌಲ್ಯಗಳ ಪರಿಚಯ, ಪ್ರಾಸಪದಗಳ ಬಳಕೆ ನುಡಿಗಟ್ಟುಗಳ ಬಳಕೆ ಎಲ್ಲವೂ ಅನಾಯಾಸವಾಗಿ ನಡೆಯುತ್ತಿತ್ತು. ಈ ಎಲ್ಲವುಗಳ ಅಭಾವದ ಇಂದಿನ ಕಾಲದಲ್ಲಿ ನಾವು ಅವನ್ನು ಪರಿಚಯಿಸುವ ನಮ್ಮದೇ ಆದ ದಾರಿ ಕಂಡು ಕೊಳ್ಳಬೇಕಾಗಿದೆ. ಇಡೀ ಸಮಾಜ ಅದರ ಕಡೆಗೆ ಗಮನ ಹರಿಸಬೇಕಾಗಿದೆ. ಅದನ್ನು ತುಂಬಿಕೊಡುವ ಇನ್ನೊಂದು ಪದ್ಧತಿ ಅಥವಾ ಸಂಸ್ಕೃತಿಯನ್ನು ಬೆಳೆಸುವುದು ನಮ್ಮೆಲ್ಲರ ಆದ್ಯ ಕರ್ತವ್ಯ. ಅದು ಒಂದು ಬಹು ದೊಡ್ಡ ಸವಾಲು.

ಈ ನಿಟ್ಟಿನಲ್ಲಿ ನಾವು ನಮ್ಮದೇ ಆದ ಸಣ್ಣ ಪ್ರಯತ್ನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಹಾಡುಗಳು ಮಕ್ಕಳ ಜೀವನದ ಒಂದು ಅಂಗವೇ ಆಗುವಂತೆ ಮಾಡಲು ಶ್ರಮಿಸುತ್ತಿದ್ದೇವೆ. ಪಠ್ಯಪುಸ್ತಕಗಳಿಂದ ದೂರ ಸರಿದು, ಜಾನಪದ ಗೀತೆ, ದಾಸರ ಪದಗಳು, ವಚನಕಾರರ ವಚನಗಳು, ಹಿರಿಯ ಕವಿಗಳ ಪ್ರಕೃತಿ ಬಗೆಗಿನ ಮತ್ತು ಇತರ ಕವಿತೆಗಳ ಪರಿಚಯದ ಜೊತೆಗೆ, ಕವಿಗಳ ಸಂಕ್ಷಿಪ್ತ ಪರಿಚಯ ನೀಡುತ್ತಿದ್ದೇವೆ. ಸಾಧ್ಯವಾದಾಗ ಆಯಾ ಕವಿಗಳ ಬಂಧುವರ್ಗದವರನ್ನು ಅಥವಾ ಅವರ ಗುರುತು ಪರಿಚಯದವರನ್ನು ಶಾಲೆಗೆ ಕರೆಯಿಸಿ ಮಕ್ಕಳೊಂದಿಗೆ ಮಾತನಾಡುವ ಅವಕಾಶ ಕಲ್ಪಿಸಿ ಕೊಡುತ್ತಿದ್ದೇವೆ. ಉದಾಹರಣೆಗೆ, ಜಿ. ಪಿ. ರಾಜರತ್ನಂ ಅವರ ಮಕ್ಕಳು ಶಾಲೆಗೆ ಬಂದು ತಮ್ಮ ತಂದೆಯವರ ಬಗ್ಗೆ ಮಾತನಾಡಿದರು. ಅಂತಹ ಅವಕಾಶವಿಲ್ಲದಿದ್ದಾಗ, ಕವಿಗಳ ಜೀವನಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟ ವಿವರಗಳನ್ನು, ಸಂಗತಿಗಳನ್ನು ಮಕ್ಕಳೊಂದಿಗೆ ಹಂಚಿಕೊಂಡು ಅವರ ಕಲಿಕೆ ಹೆಚ್ಚು ಅರ್ಥಪೂರ್ಣವಾಗುವಂತೆ ಮಾಡುತ್ತಿದ್ದೇವೆ.

ಹಾಡನ್ನು ಹೇಳುವಾಗ ಸ್ಪಷ್ಟ ಉಚ್ಚಾರಣೆಯೊಂದಿಗೆ ಹೇಳುವುದನ್ನು ರೂಢಿಸಿದರೆ ಮಕ್ಕಳು ಭಾಷೆಯನ್ನು ಸರಿಯಾಗಿ ಮತ್ತು ಬೇಗ ಕಲಿಯುತ್ತಾರೆ. ಇದರ ಜೊತೆಗೆ ಪದಲಾಲಿತ್ಯ ಅವರ ಕಿವಿಯ ಮೇಲೆ ತನ್ನದೇ ಆದ ಪ್ರಭಾವವನ್ನು ಬೀರಿ ಸಾಹಿತ್ಯದಲ್ಲಿ ರುಚಿ ಬೆಳೆಸುತ್ತದೆ. ಮಕ್ಕಳಿಗೆ ಹೇಳಿಕೊಡಬೇಕಾದ ಪದ್ಯಗಳನ್ನು ಮೊದಲು, ಹೇಳಿಕೊಡುವವರು ಆನಂದಿಸಬೇಕಾದದ್ದು ಬಹು ಮುಖ್ಯ. ಅವರ ಆ ಆನಂದವೇ ಮಕ್ಕಳಿಗೆ ತಟ್ಟುತ್ತದೆ. ಆ ಆನಂದವೇ, ಪದ್ಯಗಳನ್ನು ಮಕ್ಕಳು ಸದಾ ನೆನಪಿನಲ್ಲಿಟ್ಟುಕೊಳ್ಳುವಂತೆ ಮಾಡುತ್ತದೆ. ಪದ್ಯವನ್ನು ಹೇಳಿಕೊಡುವಾಗ, ಪದ್ಯದ ಭಾವವನ್ನು ಮನದಟ್ಟು ಮಾಡಿಕೊಂಡು, ಅದಕ್ಕೆ ತಕ್ಕಂತೆ ಧ್ವನಿಯಲ್ಲಿ ಏರಿಳಿತಗಳನ್ನುಂಟುಮಾಡಿ, ಭಾವವನ್ನು ವ್ಯಕ್ತಪಡಿಸಲು ಸಾಂಕೇತಿಕವಾದ ಅಭಿನಯವನ್ನು ಅಳವಡಿಸಿಕೊಳ್ಳುವುದು ಹೆಚ್ಚು ಸಹಾಯಕವಾಗುತ್ತದೆ.

ಈ ರೀತಿಯಾಗಿ ಪದ್ಯಗಳನ್ನು ಹೇಳಿಕೊಟ್ಟರೆ ಮಕ್ಕಳು ಮಂತ್ರಮುಗ್ಧರಾಗುತ್ತಾರೆ. ಅವರ ಮೇಲೆ, ಆದ ಪದ್ಯಗಳ ಪ್ರಭಾವ ಬಹುಕಾಲದವರೆಗೆ ಉಳಿದು ಅವರಲ್ಲಿ ಆಸಕ್ತಿ ಹುಟ್ಟಿಸುವಲ್ಲಿ ಸಫಲವಾಗುತ್ತದೆ. ನಮ್ಮ ಶಾಲೆಯ ಮಕ್ಕಳು ತಮ್ಮ ಕಲಿಕಾವಧಿಯಾದ ಏಳು ವರ್ಷಗಳಲ್ಲಿ ಸುಮಾರು ತೊಂಭತ್ತರಿಂದ ನೂರರವರೆಗೆ ಸಣ್ಣ ಮತ್ತು ದೊಡ್ಡ ಪದ್ಯಗಳನ್ನು ಕಲಿಯುತ್ತಾರೆ.



ಶಿಕ್ಷಣದಲ್ಲಿ ಕತೆಗಳ ಪಾತ್ರ

ಕತೆ ಹೇಳುವ ಮತ್ತು ಕೇಳುವ ಕಲೆ ಮಾನವನಿಗೆ ಪ್ರಕೃತಿದತ್ತವಾಗಿ ಬಂದಿದೆ. ಇದಕ್ಕೆ ಯಾವ ವಯಸ್ಸಿನ ಮಿತಿಯೂ ಇಲ್ಲ. ಮಕ್ಕಳಂತೂ ಕತೆ ಎಂದರೆ ಮೈಯೆಲ್ಲ ಕಿವಿಯಾಗಿ ಆಲಿಸುತ್ತಾರೆ. ಈ ಸಂದರ್ಭದಲ್ಲಿ ಕತೆಹೇಳುವವರ ಹೊಣೆ ಹಿರಿದಾಗಿರುತ್ತದೆ. ಕತೆಯ ಮುಖ್ಯ ಉದ್ದೇಶ ಮನರಂಜನೆಯಾಗಿ ಕಂಡು ಬಂದರೂ ಅದರ ಪ್ರಯೋಜನಗಳು ಅನೇಕವಾಗಿವೆ. ಕತೆಗಳ ಮೂಲಕ ಪರೋಕ್ಷವಾಗಿ, ಜ್ಞಾನಾಭಿವೃದ್ಧಿ, ಭಾಷೆಯ ಬೆಳವಣಿಗೆ, ನುಡಿಗಟ್ಟುಗಳ ಪರಿಚಯ, ಬುದ್ಧಿ ಮತ್ತು ತರ್ಕ ಶಕ್ತಿಯ ಬೆಳವಣಿಗೆ, ಕಾರ್ಯ ಕಾರಣಗಳ ಸಂಬಂಧ, ವ್ಯಕ್ತಿತ್ವದ ವಿಕಾಸ, ಮೌಲ್ಯಗಳ ಪರಿಚಯ ಇತ್ಯಾದಿ ಅನಾಯಾಸವಾಗಿ ಆಗುತ್ತವೆ.

ಯಾವುದೇ ವಿಷಯವನ್ನು ಸುಲಭವಾಗಿ ಗ್ರಹಿಸಲು ಮತ್ತು ಕಲಿಕೆಯನ್ನು ಸುಗಮವಾಗಿ ಮುಂದುವರಿಸಿಕೊಂಡು ಹೋಗಲು ಕತೆಗಳು ಒಳ್ಳೆಯ ತಳಹದಿಯನ್ನು ನಿರ್ಮಿಸುತ್ತವೆ. ವಾಸ್ತವವಾಗಿ ಬಹಳ ಚಿಕ್ಕ ವಯಸ್ಸಿನಿಂದಲೇ ಇದು ನಡೆಯ ಬೇಕು, ಆದರೆ ಇಂದಿನ ಸಮಯಾಭಾವದ ಜೀವನ ಶೈಲಿಯಲ್ಲಿ ಕತೆ ಹೇಳುವ ಪದ್ಧತಿ ಮಾಯವಾಗುತ್ತಿದೆ. ಆದುದರಿಂದ ನಾವು ಶಾಲೆಯಲ್ಲಾದರೂ ಅದಕ್ಕೆ ಸ್ಥಾನವನ್ನು ಕೊಡಲೇಬೇಕಾಗುತ್ತದೆ.

ಕತೆ ಹೇಳುವಾಗ ಗಮನದಲ್ಲಿಡಬೇಕಾದ ಅಂಶಗಳು:

- ಮಕ್ಕಳ ಮನೋಮಟ್ಟವನ್ನು ಅರಿತು ಅದಕ್ಕೆ ತಕ್ಕಂತೆ ಕತೆಯನ್ನು ಆಯ್ಕೆ ಮಾಡಬೇಕು.
 - ಕತೆಯನ್ನು ಹೇಳುವ ಧಾಟಿ ಏಕತಾನದಲ್ಲಿರದೆ ಕತೆಯ ವಿಷಯಕ್ಕೆ ತಕ್ಕಂತೆ ಏರಿಳಿತದ ಧ್ವನಿಯಲ್ಲಿ ಭಾವಪೂರ್ಣಗೋಳಿಸಿ, ಸಣ್ಣ ಪುಟ್ಟ ಅಭಿನಯದ ಮೂಲಕ ಪ್ರಭಾವಶಾಲಿಯಾಗಿ ಮಾಡಬೇಕು.
 - ಮಕ್ಕಳು ಕತೆಯಲ್ಲಿ ಹೇಳಿದ್ದೆಲ್ಲವನ್ನು ಮರೆಯದೆ ನೆನಪಿಟ್ಟುಕೊಳ್ಳುತ್ತಾರೆ. ಅಲ್ಲದೆ ಕತೆ ಸ್ವಾರಸ್ಯಪೂರ್ಣವಾಗಿದ್ದು, ಆಕರ್ಷಕ ರೀತಿಯಲ್ಲಿ ಹೇಳಿದ್ದರೆ ಅದನ್ನು ಮತ್ತೆ ಮತ್ತೆ ಮೆಲಕುತ್ತಾರೆ. ಅವರ ಈ ಗುಣ ಅವರ ಭಾಷಾಮಟ್ಟವನ್ನು ಹೆಚ್ಚಿಸಲು ಅನುಕೂಲವಾಗುತ್ತದೆ. ಇದನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಕತೆ ಹೇಳುವವರು ಒಂದು ಕತೆಯಲ್ಲಿ ನಿಷ್ಕೃಷ್ಟವಾದ ಪದಗಳನ್ನು ಬಳಸಬೇಕು. ಮಕ್ಕಳು ಅವನ್ನು ಸುಲಭವಾಗಿ ಕಲಿಯುತ್ತಾರೆ.
 - ವಿಷಯದ ದೃಷ್ಟಿಯಿಂದ ಭಿನ್ನತೆ ಇರುವಂತೆ ನೋಡಿಕೊಳ್ಳಬೇಕು. ಪೌರಾಣಿಕ, ಪಾರಂಪರಿಕ, ಜಾನಪದ, ಐತಿಹಾಸಿಕ, ಬುದ್ಧಿವಂತಿಕೆಯ, ಹಾಸ್ಯದ, ಜಾತಕ, ಪಂಚತಂತ್ರ, ವೈಜ್ಞಾನಿಕ, ಸತ್ಯವಿಷಯದ, ಹಿರಿಯವ್ಯಕ್ತಿಗಳ, ಸ್ವಾರಸ್ಯಕರ ಮುಂತಾದ ವಿವಿಧ ಕ್ಷೇತ್ರಗಳಿಂದ ಆರಿಸಿದ ಕತೆಗಳನ್ನು ಹೇಳುವುದರಿಂದ ಅವರ ಪದಸಂಪತ್ತು ಬೆಳೆಯುತ್ತದೆ, ಜ್ಞಾನಾಭಿವೃದ್ಧಿಯಾಗುತ್ತದೆ.
- ಹೀಗೆ ಮಾಡುವುದರಿಂದ ಸ್ವಲ್ಪ ಸಮಯದ ನಂತರ ಮಕ್ಕಳು ತಾವೇ ಕತೆಯನ್ನು ಓದಲು ಆರಂಭಿಸುತ್ತಾರೆ, ಆದರೂಕೂಡ ನಾವು ಕತೆ ಹೇಳುವುದನ್ನು ನಿಲ್ಲಿಸಬಾರದು. ಅವರು ಓದಿ ಅರ್ಥ ಮಾಡಿಕೊಳ್ಳುವ ಮಟ್ಟಕ್ಕಿಂತ ಮೇಲಿನ ಮಟ್ಟದ ಕತೆಗಳನ್ನು ನಾವು ಹೇಳುತ್ತಿರಬೇಕು.

ಕಲಿಕೆಯಲ್ಲಿ ನಾಟಕದ ಸ್ಥಾನ

ಕತೆ ಕೇಳುವುದು, ಕತೆ ಹೇಳುವುದು, ಕತೆ ಕಟ್ಟುವುದು, ಹಾಡು ಹೇಳುವುದು, ನಾಟಕ ಆಡುವುದು ಈ ಎಲ್ಲ ಗುಣಗಳು ಮಕ್ಕಳಿಗೆ ಸಹಜವಾಗಿ ಬರುತ್ತವೆ. ಇವುಗಳನ್ನು ಪೋಷಿಸಿ ಮಕ್ಕಳ ವ್ಯಕ್ತಿತ್ವವನ್ನು ವಿಕಾಸಗೊಳಿಸ ಬೇಕಾದದ್ದು ಹಿರಿಯರ, ಮುಖ್ಯವಾಗಿ ಅಧ್ಯಾಪಕರ ಆದ್ಯ ಕರ್ತವ್ಯ. ಬಾಲ್ಯದಲ್ಲಿ, ಒಂದು ಸಣ್ಣ ಹಾಡಿನ ಅಭಿನಯ ಅಥವಾ ಪ್ರಸಂಗದ ಅಭಿನಯದಿಂದ ಆರಂಭಗೊಂಡು, ವಿದ್ಯಾರ್ಥಿ ಜೀವನದಲ್ಲಿ, ನಾಟಕ ಕಲೆ ಪುಷ್ಟಿಗೊಂಡು ಬೃಹತ್ತಾಗಿ ಬೆಳೆಯುವ ಅವಕಾಶವಿರುತ್ತದೆ. ನಾಟಕ ಒಬ್ಬರೇ ಮಾಡುವ ಚಟುವಟಿಕೆಯಲ್ಲ. ಅನೇಕರು ಕೂಡಿ ಮಾಡುವ ಚಟುವಟಿಕೆ. ನಾಟಕದ ಪ್ರಸಂಗಗಳ ಅಭಿನಯ, ಇತರ ಪಾತ್ರಗಳಿಗೆ ತಕ್ಕಂತೆ ಸ್ಪಂದಿಸುವುದು, ನಿರ್ದೇಶಕರು ಹೇಳಿದುದನ್ನು ಚೆನ್ನಾಗಿ ಅರಿತುಕೊಂಡು ಪಾಲಿಸುವುದು, ಪಾತ್ರಕ್ಕೆ ತಕ್ಕಂತೆ ತನ್ನ ಸ್ವಭಾವವನ್ನು ಮಾರ್ಪಡಿಸಿಕೊಳ್ಳುವುದು ಇತ್ಯಾದಿ ನಾಟಕಕ್ಕೆ ಅತಿಮುಖ್ಯವಾದವುಗಳು. ಇನ್ನೊಬ್ಬರ ಇಚ್ಛೆ ಅನಿಚ್ಛೆ, ಆಸೆ ನಿರಾಸೆ, ಚಟುವಟಿಕೆಯ ಗತಿ, ಸಾಮರ್ಥ್ಯ, ಮನೋಲಹರಿಗಳು ಇವುಗಳನ್ನೆಲ್ಲ ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಅವುಗಳಿಗೆ ಹೊಂದಿಕೊಂಡು ವ್ಯಕ್ತಿ ತನ್ನ ಪಾತ್ರ ನಿರ್ವಹಿಸಬೇಕಾಗುತ್ತದೆ. ಇದು ಜೀವನಕಲೆಯಲ್ಲಿ ಕಲಿಯಬೇಕಾದ ಅತ್ಯಂತ ಮಹತ್ವದ ಪಾಠ. ನಾಟಕದ ಮೂಲಕ ಚಿಕ್ಕಂದಿನಿಂದಲೇ ಇದನ್ನು ಕಲಿಯುವ ಅವಕಾಶ ನಾವು ಮಾಡಿಕೊಡಬಹುದು. ಮಕ್ಕಳು ಬೇರೆ ಬೇರೆ ನಾಟಕಗಳಲ್ಲಿ ಬೇರೆ ಬೇರೆ ಪಾತ್ರ ಧರಿಸಿದಾಗ ಆಯಾ ಪಾತ್ರಗಳ ಸ್ವಭಾವದ ಮನವರಿಕೆ ಮಾಡಿಕೊಂಡು, ಅಭಿನಯಿಸ ಬೇಕಾಗುತ್ತದೆ. ಇದರಿಂದ ಮಾನವನ ಸ್ವಭಾವಗಳ ಅರಿವು ಉಂಟಾಗುತ್ತದೆ, ಮತ್ತು ಹೃದಯ ವಿಶಾಲಗೊಳ್ಳುತ್ತದೆ.

ಒಂದು ಕತೆಯನ್ನು ಆರಿಸಿದ ಮೇಲೆ, ಅದನ್ನು ನಾಟಕವನ್ನಾಗಿ ಮಾಡುವಾಗ ಮಕ್ಕಳನ್ನು ಅದರಲ್ಲಿ ತೊಡಗಿಸುವುದು ಒಳ್ಳೆಯದು. ಇದರಿಂದ ಕತೆ ಮತ್ತು ನಾಟಕಕ್ಕೆ ಇರುವ ವ್ಯತ್ಯಾಸ ಮಕ್ಕಳಿಗೆ ಮನದಟ್ಟಾಗುತ್ತದೆ. ಚರ್ಚೆಗೆ ಅವಕಾಶ ಕೊಟ್ಟಲ್ಲಿ, ಅವರು ತಮ್ಮ ತಮ್ಮಲ್ಲಿಯೇ ವಿಚಾರ ವಿನಿಮಯ ಮಾಡಿಕೊಂಡು ಉತ್ತಮವಾದ ಸಲಹೆಗಳನ್ನು ಕೊಡುತ್ತಾರೆ. ಸಲಹೆ ಸಮರ್ಪಕವಾಗಿರದಿದ್ದಲ್ಲಿ ಅದನ್ನು ಅವರೊಂದಿಗೆ ಚರ್ಚಿಸುವುದು ಬಹು ಮುಖ್ಯ. ಸಂಭಾಷಣೆಗಳನ್ನು ಬರೆಯುವಾಗಲೂ ಇದೇ ನೀತಿ ಇಟ್ಟು ಕೊಳ್ಳುವುದು ಒಳಿತು. ಪಾತ್ರಕ್ಕೆ ತಕ್ಕಂತೆ ಭಾಷೆಯ ಬಳಕೆ ಇರಬೇಕು ಎಂಬುದು ಅವರ ಗಮನಕ್ಕೆ ಬರುತ್ತದೆ. ಅವರುಗಳು ಹೇಳಿದ ಮಾತುಗಳನ್ನು ಬರೆಯುವಾಗ ಆಡು ಭಾಷೆಗೂ ಬರವಣಿಗೆಯ ಭಾಷೆಗೂ ಇರುವ ವ್ಯತ್ಯಾಸ ಹೆಚ್ಚು ಮನದಟ್ಟಾಗುತ್ತದೆ. ಸಂಭಾಷಣೆ ಹೆಚ್ಚು ಪ್ರಭಾವಶಾಲಿಯಾಗಲು ನಾಣ್ಯಡಿಗಳನ್ನು ಹೇಗೆ, ಎಲ್ಲಿ, ಉಪಯೋಗಿಸಬಹುದು ಎಂಬುದನ್ನು ಅಧ್ಯಾಪಕರು ತೋರಿಸಿಕೊಡಬಹುದು. ಚಿಕ್ಕ ಪುಟ್ಟ ಹಾಡುಗಳನ್ನು ಕಟ್ಟಿ ಸಂದರ್ಭಕ್ಕೆ ತಕ್ಕಂತೆ ನಾಟಕದಲ್ಲಿ ಹೆಣೆಯುವುದರಿಂದ ಅದರ ಪ್ರಭಾವ ಹೆಚ್ಚುವುದನ್ನು ತೋರಿಸಿ ಕೊಡಬಹುದು. ಪಾತ್ರಗಳ ಆಯ್ಕೆಯನ್ನು ಅವರಿಗೆ ಬಿಟ್ಟುಕೊಡುವುದರಿಂದ ಅವರಲ್ಲಿ ಹೊಣೆಗಾರಿಕೆಯ ಅನುಭವವಾಗಿ ಅದನ್ನು ಸಮರ್ಪಕವಾಗಿ ನಿರ್ವಹಿಸುವಂತೆ ಮಾಡುತ್ತದೆ. ರಂಗ ಸಜ್ಜಿಕೆ, ರಂಗ ಪರಿಕರಗಳ ತಯಾರಿಕೆ, ವೇಷಭೂಷಣಗಳ ವಿನ್ಯಾಸ ಇತ್ಯಾದಿಗಳಲ್ಲಿ ಅವರನ್ನು ತೊಡಗಿಸಿಕೊಳ್ಳುವುದರಿಂದ ಅವರ ಕಲಿಕೆ ವೃದ್ಧಿಗೊಳ್ಳುತ್ತದೆ. ನಾಟಕ ಆಡುವಾಗ ಸಂಭಾಷಣೆ, ನಾಟಕೀಯತೆ, ಅಭಿನಯ, ಧ್ವನಿಯ ಏರಿಳಿತ ಇತ್ಯಾದಿಗಳನ್ನು ಅಭ್ಯಸಿಸಬೇಕಾಗುತ್ತದೆ. ಈ ಕಲಿಕೆ ಮಗುವಿನಲ್ಲಿ ಶಿಸ್ತು, ಆತ್ಮ ವಿಶ್ವಾಸ, ಆನಂದಗಳನ್ನು ಮೂಡಿಸುತ್ತವೆ.

ಮೇಲೆ ಹೇಳಿದ ಗುಣಗಳ ಬೆಳವಣಿಗೆಯನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು, ಮಕ್ಕಳ ಮನೋಮಟ್ಟಕ್ಕೆ ತಕ್ಕಂತಹ ವಿಷಯಗಳನ್ನು ಆರಿಸಿ ನಾಟಕವಾಡಲು ಅಧ್ಯಾಪಕರು ಅವಕಾಶ ಮಾಡಿ ಕೊಡಬೇಕು.

ಪರಿಯೋಜನೆ

ಒಂದು ಪಠ್ಯ ಪುಸ್ತಕದಲ್ಲಿ ಅನೇಕ ವಿಷಯಗಳಿಗೆ ಬಿಡಿ ಬಿಡಿಯಾದ ಸಂಕ್ಷಿಪ್ತವಾದ, ಲೇಖನಗಳಿರುತ್ತವೆ. ಸಮಯದ ಅಭಾವದಿಂದ ಅವುಗಳನ್ನು, ಅವುಗಳ ಒಂದು ಮುಂದುಗಳ ಸಂದರ್ಭ ತಿಳಿಸದೆ, ಜೀವನದಿಂದ ಪ್ರತ್ಯೇಕಗೊಳಿಸಿ, ಕೇವಲ ಒಂದು ಬಿಡಿಯಾದ ಪಾಠದಂತೆ ಹೇಳಿಕೊಟ್ಟಾಗ, ಅದು ಮಗುವಿಗೆ ನೀರಸವಾದ, ಯಾವ ಅರ್ಥವೂ ಕೊಡದ ಆದರೆ, ತಾನು ಮಾಡಿ ಮುಗಿಸಲೇ ಬೇಕಾದ ಕಠಿಣ ಕೆಲಸವಾಗುತ್ತದೆ. ಇಂತಹ ಸಂದರ್ಭದಲ್ಲಿ ಪರಿಯೋಜನೆಗಳು ಅತ್ಯಂತ ಔಚಿತ್ಯಪೂರ್ಣ.

ಪರಿಯೋಜನೆ ಎಂದರೆ, ಆರಿಸಿಕೊಂಡ ಒಂದು ವಿಷಯದ ಸುತ್ತ, ಸಂದರ್ಭಕ್ಕೆ ತಕ್ಕಂತೆ, ಸಾರ್ಥಕವಾದ ಇತರ ವಿಷಯಗಳನ್ನು ಅಳವಡಿಸಿ, ಆ ವಿಷಯದ ಬಗ್ಗೆ ಸಾಧ್ಯವಾದ ಮಟ್ಟಿಗೆ ಒಂದು ಇಡಿಯಾದ ಚಿತ್ರವನ್ನು ಮನಸ್ಸಿಗೆ ಮುಟ್ಟುವಂತೆ ಬಿಂಬಿಸುವ ಒಂದು ಪ್ರಯತ್ನ. ಇಂತಹ ಒಂದು ಪ್ರಯೋಗದ ಉದಾಹರಣೆ ಕೆಳಗೆ ಕೊಟ್ಟಿದೆ.

ಗೋವಿನ ಹಾಡು ಒಂದು ಪರಿಯೋಜನೆ:

ಅಧ್ಯಾಪಕನ ಪೂರ್ವ ಸಿದ್ಧತೆ:

ನಿರಂತರವಾದ ಅಧ್ಯಯನ ಮತ್ತು ಚಿಂತನೆಗಳೇ ಅಧ್ಯಾಪಕನ ಮೂಲ ಬಂಡವಾಳ. ಯಾವುದೇ ವಿಷಯವನ್ನು, ಒಂದು ಪರಿಯೋಜನೆಯ ರೂಪದಲ್ಲಿ ಪ್ರಸ್ತುತಪಡಿಸಬೇಕೆಂದುಕೊಂಡಾಗ, ಆ ವಿಷಯದ ಬಗ್ಗೆ ಆಳವಾಗಿ ಚಿಂತನೆ ಮಾಡುವುದು ಬಹು ಮುಖ್ಯ. ಗೋವಿನ ಹಾಡನ್ನು ಅದಕ್ಕಾಗಿ ಆರಿಸಿಕೊಂಡಾಗ, ಅದರ ಮೂಲರೂಪವನ್ನೂ, ಅದು ಹುಟ್ಟಿಕೊಂಡ ಬಗೆಯನ್ನೂ, ಅದರ ಇತರ ರೂಪಗಳನ್ನೂ, ಅದರ ಉದ್ದೇಶವನ್ನೂ, ಅದರ ಧ್ವನಿಯನ್ನೂ ಚೆನ್ನಾಗಿ ಅರ್ಥಮಾಡಿಕೊಳ್ಳಬೇಕು. ಅದರ ಬಗ್ಗೆ, ಇತರ ಹಿರಿಯ ಲೇಖಕರು ಮತ್ತು ಚಿಂತಕರು ಬರೆದ ವಿಷಯಗಳನ್ನು ಓದುವುದೂ ಸೂಕ್ತ. ಹೀಗೆ ಮಾಡಿದಾಗ, ಆ ವಿಷಯದ, ಆಳ ಮತ್ತು ಮಿತಿಗಳು, ಗಮನಕ್ಕೆ ಬಂದು, ಆ ಪರಿಯೋಜನೆಯ ರೂಪ ತಾನೇ ತಾನಾಗಿ ಬಿಚ್ಚಿಕೊಳ್ಳುತ್ತದೆ.

(ಉದಾಹರಣೆಗೆ, ಪು.ತಿ.ನ., ಯು. ಆರ್. ಅನಂತಮೂರ್ತಿ, ಮುಂತಾದವರ ಲೇಖನಗಳು, ಎಸ್. ಎಲ್. ಭೈರಪ್ಪನವರ “ತಬ್ಬಲಿಯು ನೀನಾದೆಮಗನೆ” ಕಾದಂಬರಿ ಇತ್ಯಾದಿ.)

ಉದ್ದೇಶ: ಕನ್ನಡ ನಾಡಿನ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ,
ಭಾರತೀಯ ಸಮಾಜದಲ್ಲಿ ಗೊಲ್ಲರ, ಹಸುಗಳ, ಗೋಮಾಳದ ಸ್ಥಾನ,
ಹಸುವಿನ ಸ್ಥಿತಿಗತಿ- ಹಿಂದೆ ಮತ್ತು ಇಂದು,
ಗೋವಿನ ಹಾಡಿನ ಉದ್ದೇಶವನ್ನು ಪ್ರಕಾಶಕ್ಕೆ ತರುವ ಪ್ರಯತ್ನ.

ಮೂಲವಾಗಿ ಉಪಯೋಗಿಸಿದ

ವಿಷಯ ವಸ್ತುಗಳು:

ಗೋವಿನ ಹಾಡು,
ವರದೇನಹಳ್ಳಿಯ ಗೊಲ್ಲರು,
ಹಂಪಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ ಪ್ರಕಟಿಸಿದ ಪುಸ್ತಕ “ ಪುಣ್ಯಕೋಟಿ ”
“ ಪುಣ್ಯಕೋಟಿ ” ನಾಟಕ ಮತ್ತು “ ಗೋವಿನ ಬಾಳು ” ಹಾಡು,
ಹಸುವಿನ ಬಗ್ಗೆ, ಪತ್ರಿಕೆಯಿಂದ ಆಯ್ದ ಲೇಖನ.

ಈ ಉದ್ದೇಶಗಳನ್ನು ಆಧರಿಸಿದ

ಸಾಮಾನ್ಯ ಚಟುವಟಿಕೆಗಳು:

ಕೃಷ್ಣನ ಕತೆ,
ಗೋವಿನ ಕತೆಗಳ ರೂಪಾಂತರ,
ಸತ್ಯದ ಗೆಲುವಿನ ಕತೆಗಳನ್ನು ಆಲಿಸುವಿಕೆ.
ಉದಾಹರಣೆಗೆ, ಗಾಂಧೀಜಿ, ಬುದ್ಧ ಮತ್ತು ಸುಧಾಮೂರ್ತಿಯವರು ಬರೆದ
“ಏರಿಳಿತದ ದಾರಿಯಲ್ಲಿ” ಯಿಂದ ಆರಿಸಿದ ಕತೆಗಳು.
ವರದೇನ ಹಳ್ಳಿಯಲ್ಲಿ ಗೊಲ್ಲರ ಸಂದರ್ಶನ,
ಹಸುವಿನ ಲಾಲನೆ ಪಾಲನೆ ಮತ್ತು ಅದರ ಸ್ಥಿತಿಗಳ ಬಗ್ಗೆ ತಿಳುವಳಿಕೆ,
ಪದ್ಯವನ್ನು ಹಂತ ಹಂತವಾಗಿ ಬಾಯಿಪಾಠ ಮಾಡುವುದು,
ಅದನ್ನು ನಾಟಕದ ರೂಪದಲ್ಲಿ ಪ್ರದರ್ಶಿಸುವುದು,
ನಾಟಕಕ್ಕೆ ಬೇಕಾದ ಪರಿಕರಗಳನ್ನು ತಯಾರಿಸುವುದು,
ಹಾಲಿನ ಪೌಷ್ಟಿಕತೆಯ ಬಗ್ಗೆ ತಿಳಿದುಕೊಂಡು ಭಕ್ಷ್ಯಗಳನ್ನು ತಯಾರಿಸುವುದು,
ಸಾಧ್ಯವಾದರೆ ಗೋಶಾಲೆಗೆ ಒಂದು ಭೇಟಿ.

ಭಾಷಾ ಚಟುವಟಿಕೆ:

ಹಾಡಿನ ಕಲಿಕೆ,
ಪುಸ್ತಕವನ್ನು, ಸರಿಯಾದ ಉಚ್ಚಾರಣೆಯೊಂದಿಗೆ ನಿರರ್ಗಳವಾಗಿ ಓದುವುದು,
ಸಮಾನಾರ್ಥಕ ಮತ್ತು ವಿರುದ್ಧಾರ್ಥಕ ಪದಗಳನ್ನು ಕಲಿಯುವುದು.
ಪದಗಳನ್ನು ವಿಂಗಡಿಸುವುದು,
ಪ್ರಶೋತ್ತರಗಳನ್ನು ಬರೆಯುವುದು,
ಗೊಲ್ಲರ ಸಂಕ್ಷಿಪ್ತ ಪರಿಚಯ ಬರೆಯುವುದು ಇತ್ಯಾದಿ.

ಪರಿಯೋಜನೆಯಲ್ಲಿ ಅಳವಡಿಸುವ ವಿಷಯಗಳು ಸಾಕಷ್ಟಿರುತ್ತವೆ. ಆದರೆ ನಾವು, ಸಮಯದ ಮತ್ತು ಮಕ್ಕಳ
ಆಸಕ್ತಿಯ ಮಿತಿಯನ್ನು ಅರಿತು ಅದಕ್ಕೆ ತಕ್ಕಂತೆ ಕಲಿಕೆಯ ವಿಷಯವನ್ನು ರೂಪಿಸುವುದು ಸೂಕ್ತ.

Toy Making

Vidula Mhaikar

On the second afternoon of the conference, the assembly hall at CFL was privy to a most unusual and entertaining spectacle: grown men and women blowing on straws and flying paper planes with all the enthusiasm of a bunch of ten year-olds! It is impossible for us to convey on boring plain paper the principles of a toy workshop. All we can do here is to share with you some photographs of that afternoon, and direct you to Arvind Gupta's website, which contains details of hundreds of books, toys and activities.

The hallmark of the toy workshop was the use of trash and waste material to make simple scientific concepts come alive, in ways children can both participate in and relate to.

<http://arvindguptatoys.com> will open a world of fun, and if you're not careful you might end up learning something!



Section Three: Workshops for Middle and Senior Age Groups

Math for Middle School

Shashidhar Jagadeeshan and Kamala Mukunda

Our approach to the teaching of mathematics

Many of us love mathematics and see that it is beautiful and part of an infinite order. However, a large number of children in almost all cultures are frightened or bored by mathematics. We as teachers seem to convey a sense of fear and helplessness with regard to mathematics rather than conveying its beauty and power. This feeling seems to persist even into adulthood. I am sure many among you have had the following experience. You meet a stranger and they ask you what your profession is; you say you teach mathematics and immediately they respond by either saying that they were very good at mathematics or become apologetic about having been terrible at mathematics! The most humorous incident in this regard that happened to me is when a German visitor told me “I am not scared of mathematics teachers, I am very good at mathematics”! In short very few are neutral towards mathematics – they either love it or hate it!

What is it about mathematics that creates this fear? We explore certain aspects of mathematics that contribute to this feeling.

Absolute authority imbued to the teacher

In a typical mathematics class, since all information flows from the teacher, students immediately set him or her up as an authority. There is really no room for discussion, where the student can contribute at a level comparable to the teacher. This feeling is further strengthened by the fact that students are rarely exposed to problems to which the teacher does not already know the solution, or where the teacher is ready to admit that he does not know and is willing to learn along with the student.

How do we loosen this authority?

- An affectionate and open relationship is an absolute must, if true learning has to take place. In fact none of the suggestions we offer will work, unless the teacher allows for such a relationship.
- Create an environment where students feel free to discuss their mathematical ideas.
- Expose students to open problems and other egalitarian situations where the teacher and the student are thinking and learning together. As a teacher it is a

great relief to admit once in a while that you do not know everything! Moreover, students can benefit from watching the teacher grapple with a problem. Number theory affords many such problems.

A sense of inadequacy

All over the world children and adults seem to classify themselves as ‘intelligent’ or ‘stupid’ depending on how they perform in mathematics. I feel it is very important as teachers that we do not equate intelligence with mathematical ability. Students can be well aware of differing abilities and capacities among each other in various fields. However, this awareness need not translate to low self-esteem.

How can this be accomplished?

- Encourage a spirit of cooperative learning, where students who find mathematics easy help those who do not.
- Do projects where the emphasis is on other aspects of mathematics than the algorithmic and arithmetical, such as spatial reasoning, pattern recognition, logical reasoning and aesthetics. Examples of such projects are: tessellations, constructing platonic solids, exploring patterns in the Pascal’s triangle, Fibonacci sequences and nature, fractals and so on.
- Such projects do not require a lot of prerequisite knowledge and so all children can partake in it on an even footing.

An assumption that there is only one way to solve a problem

The student often has the oppressive feeling while attempting a problem that the solution should come out cleanly, elegantly and in one attempt. In fact problem solving is the perfect arena to show children that many different approaches can legitimately give right answers. I am listing a few:

- Use trial and error as a legitimate strategy to find solutions and then try and understand why the solution makes sense.
- Using multiple approaches to solve a problem. For example, suppose you are given a random circle – how will you locate its centre? For a large class of problems we can come up with more than one approach.
- The teacher can model problem solving for the students, thinking aloud and demonstrating various methods and approaches.

A belief that mathematics does not allow experimentation

Mathematicians pride themselves that they need no more equipment than paper and pencil. However this notion can lead to false beliefs, for example, that mathematics does not lend itself to experimentation and exploration. Even in the most abstract areas of mathematics, intuition often comes from playing around

with concrete cases and very often pictures.

To dispel this belief:

- Wherever possible do simple experiments and use models and teaching aids to motivate a result.
- Encourage the use of pictures and graphs to represent and understand a problem. A pictorial representation can help us understand why a particular result is true and also help us conjecture results. For example, using graphs one can help students come up with all the solutions to equations such as $\sin x = 0.5$, and even derive the general formula for all cases.

Conclusion

In the course of this workshop, we hope that many of the ideas suggested above will be illustrated concretely and you will get a feel for what we are talking about. However, we would like to emphasize that we as teachers must be willing to question our own attitudes towards the learning and teaching of mathematics, and these projects and ideas can only supplement such a process of change.

Project 1: Logical thinking in mathematics

(This series of activities strengthening logical thinking in students is modified from the Nuffield Mathematics Programme.)

Age group: 10 to 12 years of age. Ideally suited for the time before they learn sets, Venn diagrams, or probability.

Duration: 5 or more sessions of 45 mins each

Objectives:

- to think clearly and logically about categories and sets
- to learn the precise mathematical use of the following words – and, or, not, neither, either, all, some, none, every, only, if, but.

Session 1

a. Give your class two lengths of rope (say 6m each) and tell them to ‘fence’ themselves off into two fields:

those who have a sister, those who have a brother.

Tell them to work together to do this. With minimum guidance from you, they will end up creating a neat Venn diagram, with the classroom as the Universal set!

b. Ask them a series of questions about their arrangement:

“Tell me as briefly and clearly as possible, who are (these students)?” Where ‘these’ students would refer to the sets $A \cap B$, $(A \cup B)'$, $A \cup B$, $A \cap B'$, $A' \cap B$

They should come upon the most precise phrasing as possible, as shown below.

Those who have both a sister *and* a brother

Those who have *neither* a sister *nor* a brother

Those who have *either* a sister *or* a brother

Those who have *only* a sister; or, those who have a sister but no brother

Those who have *only* a brother; or, those who have a brother but no sister

In discussing their answers, make sure the words AND, OR, NOT, ONLY, EITHER, NEITHER/NOR are used correctly, and highlight their use by writing them on the board. Watch out for the way OR is used – it is sometimes confused with AND.

c. Repeat this exercise with other categorizations. Examples are given below.

Those who like milk, those who like curd.

Those who have a dog, those who have a cat.

Those who like to swim, those who like to sing.

Those who like bitter gourd, those who like raisins.

d. If these have not already occurred in the above examples, give them situations where you know you will get a set within a set (subset), or no intersection (mutually exclusive categories). This will allow you to practice the use of words such as NONE, ALL, SOME. Examples of such situations are given below:

Those who have long hair, those who are girls (to be used in a class where the boys don't have long hair)

Those who are under 12 years, those who are under 13 years (to be used in a class where no child is yet 13 years old).

Those who walk to school, those who take the bus

Session 2

Shift to a slightly more abstract situation – working with cut-out shapes. Use this set of shapes with a group of 4 to 6 students, working cooperatively on the Logic Worksheet. Here, the words ALL, SOME, NONE, AND, OR are practiced.

The Logic Worksheet

To be used with two large loops of string, and a special set of 17 pieces:

Triangles – 3 red, 2 blue and 2 brown; Squares – 1 blue and 1 brown; Circles – 1 brown; Ellipses – 2 blue and 2 green; Pentagons – 3 blue.

1. Put all the triangles in one loop, and all the blue shapes in the other loop. How would you describe the shapes outside both loops, and the shapes inside both loops?

2. Put the two loops so that they do not overlap. Try to put all the red

shapes in one loop, and all the ellipses in the other loop. Can you do it? Why?

3. Put all the triangles in one loop, and all the red shapes in the other loop. Describe what you see.

4. Are all the red shapes in your set triangles? Are all the triangles red?

5. Make a pile of shapes such that all the blue ones are ellipses. Which shapes are not in your pile? Are all the ellipses in your pile blue?

6. True or False:

All the pentagons are blue

All the blue shapes are pentagons

None of the triangles are green

None of the green shapes are triangles

All the green shapes are ellipses

Some of the ellipses are green

7. Write down some statements of your own that are true about the set of shapes.

Session 3

Introduce the phrase ‘if.....then.....’ as another way of expressing ‘all’ and ‘none’ sentences. In question 6 of the logic worksheet, students can rephrase ‘all pentagons are blue’ (if a shape is a pentagon then it is blue), and so on. They can also rephrase ‘none of the triangles are green’ (if a shape is a triangle then it is not green), and so on.

Let the students investigate the reverse of these statements, such as ‘if a shape is blue then it is a pentagon’. Are these also true? What is special about the situations where both an if...then... statement and its reverse are true? You could even introduce the use of ‘if and only if’ – a beautiful phrase and very useful for mathematicians! Examples from school mathematics that use ‘if and only if’ logic are divisibility rules and Pythagorus theorem.

Ask them to explain why statements with ‘some’ (eg., some triangles are red) cannot easily be rephrased as if...then... statements. Have them investigate this with several such statements, using the set of shapes given.

Session 4

Shift to a more abstract situation, using numbers as elements. For convenience, fix the ‘universe’ as natural numbers between 0 and 25, say. Students will now be drawing circles in their notebooks and putting elements in. Examples are:

- Odd numbers, perfect squares
- Numbers greater than 10, numbers less than 20

- Numbers divisible by 3, numbers divisible by 4 (or 6, as a variation)
- Prime numbers, even numbers

They can be encouraged to write true statements about numbers using all the key words they have learned so far (each of them should have this list handy).

Session 5 and onwards

Play several logic games with this 48 card set. There are cards of three shapes, four colours, two sizes and marked/unmarked. The one-difference game is played by distributing cards equally to everyone (for large groups they can play in pairs). The object of the game is to get rid of your cards quickly, and you play by putting down a card from your collection that has *only one* difference (colour *or* shape *or* size *or* mark) from the card at the top of the centre pile. If you do not have any suitable card, you pass your turn.

Variations of this game are two-difference, three-difference and four-difference. It helps students to state aloud the differences they are making when they place their card down. For example, for a two difference game: *I am changing size and shape*. Players can ‘challenge’ each other with the obvious consequences, and so on!

Another game with this set is twenty questions. One student chooses a card and hides it. The others have to guess, using only yes/no questions, which one she has chosen.

Play a Venn diagram game – make three loops of string on the ground, allowing for overlaps as in a Venn diagram, and representing three attributes such as a colour, a shape and a size. Distribute the cards randomly to students. Each in turn has to place one of their cards in the correct place. If you want to make it a game with points scored etc., you could limit the time given to the student to correctly place their card. But not the first time you play it!

Since there are 4 variable factors in the 48 card set, you could extend to four loops (place all red shapes in one loop, all triangles in one loop, all large shapes in one loop, and all marked shapes in one loop). *However*, it’s an interesting fact that you can’t do this with circular loops! Try it – you can do it with other shapes though (ellipses, squares...).

Project 2: Nets and 3 dimensional solids

Age group: 11 and 12 year olds.

Duration: Roughly one period a week for about ten weeks

Objectives:

- to become familiar with some basic 3D solids (their proper names, 2D sketches and nets)

- to learn to use ruler, compass, protractor to construct nets given angles and lengths
- to develop spatial reasoning abilities and visual imagination
- to develop a sense of the importance of precision and neatness in work

Session 1

Name several basic solids: cube, cuboid, prism, tetrahedron, square based pyramid, cylinder, cone and sphere.

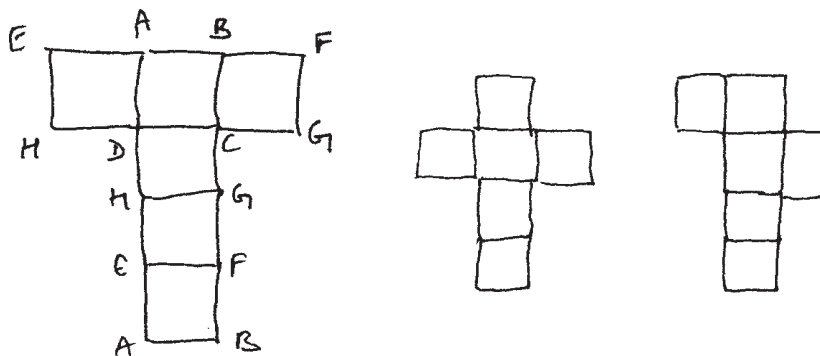
In each case, learn to draw the shape on a 2D plane.

Introduce the terms vertex, edge and face, and count the number of each for the shapes.

Make a table of vertices, edges and faces. Is there a pattern?

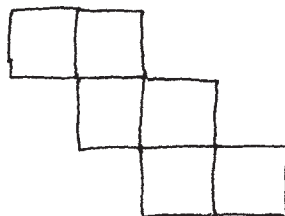
Session 2

When you go to a bakery, cakes and pastries are often packed in boxes folded on the spot. How is the cardboard cut to the right shape to make the boxes we want? The right shape is called a net. Let's start with the cube, the simplest. What would the net look like?



The cube has 8 vertices, so name all vertices in this net correctly from A through H. This process should be done with every net drawn from now on.

Are there other possibilities for a cube net?



Are there nets that would not work?

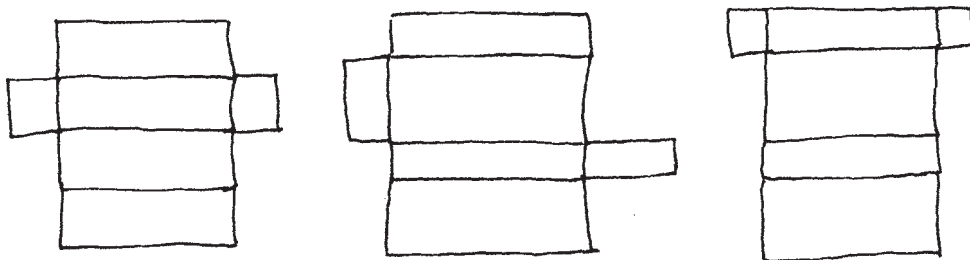


Having sketched a few nets, now we actually construct a net. The difference is in the precision. Accurate perpendiculars cannot be drawn by eye; they must be constructed using ruler and compass, or protractor. The nets are constructed on stiffish paper and before they are cut, the students must draw in the right number of flaps in the right places – not too many or too few!

In constructing their nets, the students can be given a choice of dimension (side of the cube). As they fold it, they receive immediate feedback on the precision or neatness of their own construction (edges may not meet, may overlap).

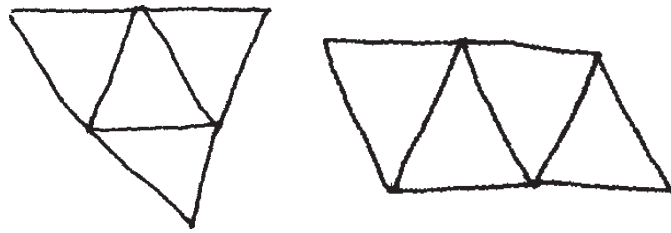
Session 3

Repeat the previous session for the cuboid. Possible nets are shown below. One impossible net is shown; students should be able to imagine why it will not work.



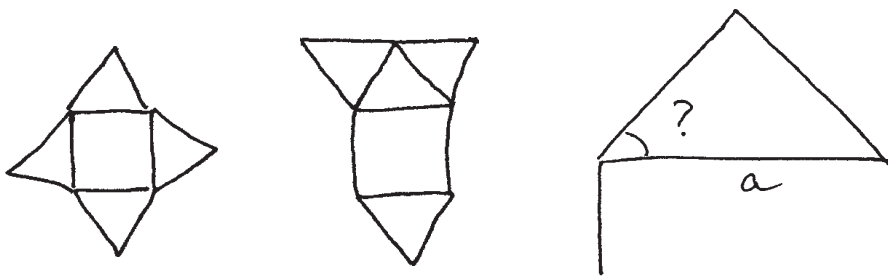
Session 4

For the tetrahedron, do a regular one. Sketch two nets, and construct any one or both, students to choose their own dimension. Students will realize the triangles must be equilateral, and you can show them how to use straight edge and compass to construct the equilateral triangle.



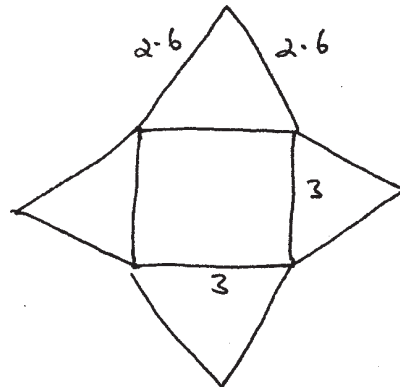
Session 5

For the square based pyramid, begin with the straight one (not skewed). Sketch two possible nets, naming the vertices as usual. Construct, allowing students to choose the length of the base, and the slant height of the pyramid by choosing the size of the base angle in each triangle. In the construction of this net, they will see that the triangles must be isosceles, and they will also see that the base angle must be greater than 45 to allow a pyramid to form.



Session 6

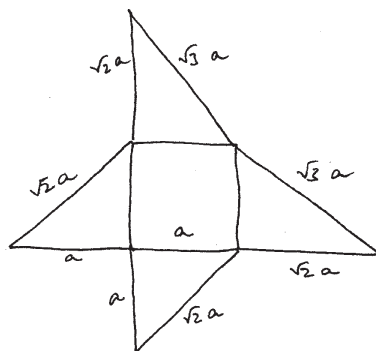
Have each student construct the net of a square based pyramid from the following sketch.



This sketch makes the slant height of the pyramid roughly half of the square root of 3 times the side of the base, or half the body diagonal of a cube made from six such pyramids! If you have a prepared cube net of the right size, six pyramids can be stuck onto it to make a fun folding toy. The students can try to understand how you came up with the slant height value, and if they know Pythagoras theorem they can derive the exact value.

Session 7

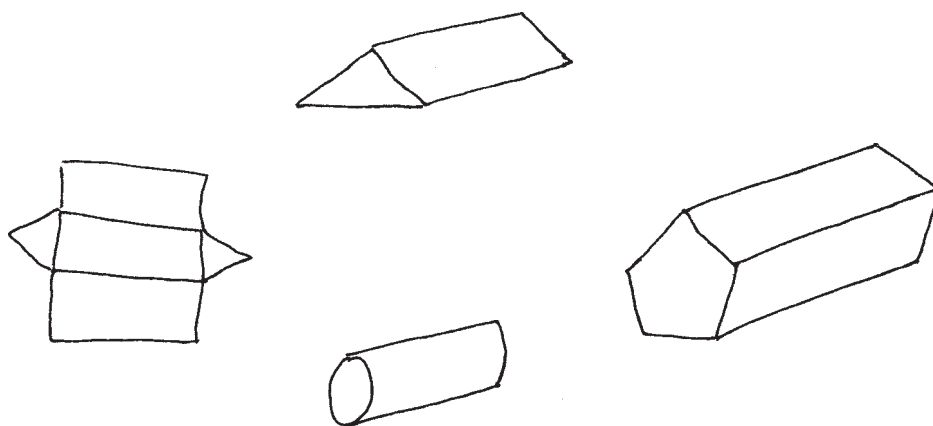
As a special topic, provide them the following net for a skewed or slanted square based pyramid.



Three of these will form a cube.

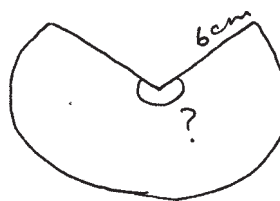
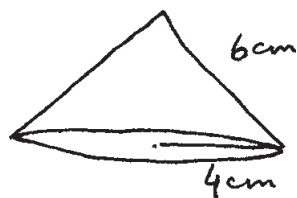
Session 8

Students can now construct their own nets for prisms (3D solids with uniform cross section) of their own choice – see examples. This leads to an understanding of the net of a cylinder open at both ends, as a rectangle!



Session 9

Investigate the shape of a net for a cone without its base. Most students make it a triangle, so they need to cut and try it out before coming upon the idea of a sector of a circle. They can try it out for different radii and angles of the sector, noting how the dimensions (height and base) of the cone vary. As a challenge, especially if they are not acquainted with pi, have them come up with the net for a cone of given dimensions, if we are given that the circumference of any circle is roughly 6 times its radius. They may be able to derive that the ratio of base radius to slant height is the same as arc length to total circumference in the net.



Session 10

What about the sphere? They can see that it is not possible to make a perfect net for a sphere, even though it was possible to make nets for other curved surfaces such as cylinder and cone. You can show them various world map projections to indicate how that mapping problem is solved in different ways.

Project 3: Difference of squares – an exploration*

Age group: 12 – 13 year olds

Duration: One session of 45 minutes or at most two

Objective: Help children discover the identity through simple numerical calculations.

Step I

Compute the following differences of squares:

$$2^2 - 1^2 =$$

$$3^2 - 2^2 =$$

$$4^2 - 3^2 =$$

$$5^2 - 4^2 =$$

$$6^2 - 5^2 =$$

Do you see any pattern? Can you predict the following differences of squares?

$$7^2 - 6^2 =$$

$$8^2 - 7^2 =$$

How about

$$2006^2 - 2005^2 = ?$$

Now can you write down a formula using letters like x and y ?
(Students' first guess may be)

$$x^2 - y^2 = x + y$$

Are there any conditions on x and y ? Yes!

$$x - y = 1$$

* I would like to thank Mr. Tanuj Shah of Rishi Valley for introducing me to this idea.

So we can say

Check on an example:

According to us

$2006^2 - 2005^2$, should be $2006 + 2005 = 4011$

Let us check:

$$2006^2 = 4024036$$

$$2005^2 = 4020025$$

$$4024036 - 4020025 = 4011 = 2006 + 2005$$

So our formula works!

Step II

Compute the following differences of squares:

$$3^2 - 1^2 =$$

$$4^2 - 2^2 =$$

$$5^2 - 3^2 =$$

$$6^2 - 4^2 =$$

$$7^2 - 5^2 =$$

$$x^2 - y^2 =$$

Do you see any pattern? Can you predict the following differences of squares?

$$7^2 - 5^2 =$$

$$8^2 - 6^2 =$$

How about

$$2006^2 - 2004^2 = ?$$

Now can you write down a formula using letters like x and y ?

(With some help students may guess)

$$x^2 - y^2 = 2(x + y)$$

What about conditions on x and y ? Yes, we still have some conditions on x and y .

$$x - y = 2$$

So we can say

$$x^2 - y^2 = 2(x + y), \text{ if } x - y = 2$$

Check on an example:

So once again our formula works!

Step III

Now let us compute the following differences of squares:

$$4^2 - 1^2 =$$

$$5^2 - 2^2 =$$

$$6^2 - 3^2 =$$

$$2006^2 - 2004^2 \text{ should be } 2(2006 + 2004), \text{ let us check}$$

$$2006^2 = 4024036$$

$$2004^2 = 4016016$$

$$4024036 - 4016016 = 8020 = 2(2006 + 2004)$$

You might have already noticed that the difference between our chosen numbers is now 3. Remember in Step I it was 1 and in Step II it was 2.

Do you see any pattern? Can you straightaway write down a formula using letters like x and y?

(With some help students may guess)

$$x^2 - y^2 = 3(x + y), \text{ if } x - y = 3$$

Let us check the formula on some large numbers:

$$2006^2 - 2003^2, \text{ should be } 3(2006 + 2003) = 12027$$

$$2006^2 = 4024036$$

$$2003^2 = 4012009$$

$$4024036 - 4012009 = 12027$$

So once again our formula works!

Step IV

Now can you write down a formula for

$$x^2 - y^2 = ?$$

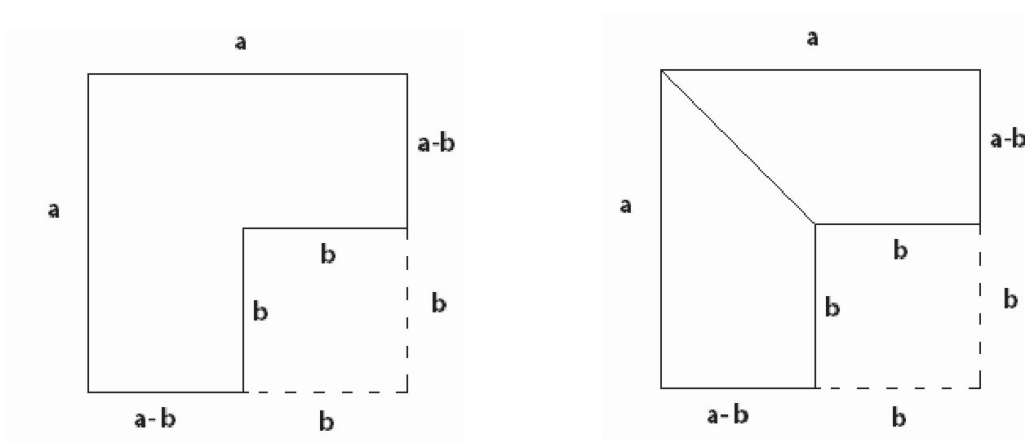
Yes! The formula is:

$$x^2 - y^2 = (x - y)(x + y)$$

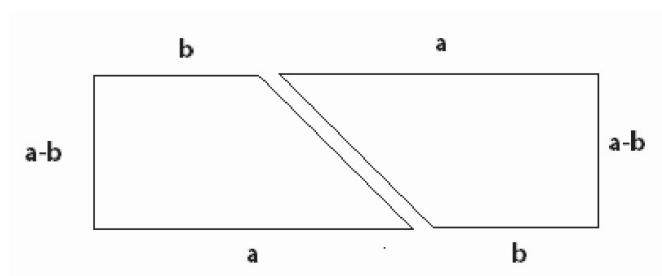
Notice we should mention here that in all our examples, x and y are natural numbers and we have also assumed that $x > y$. However, the point of the project is to help the child discover this result and after that one can always generalise to take into account all cases.

To demonstrate that the result is true for all positive real numbers a and b , perhaps the following pictorial proof is the best option.

$$a^2 - b^2$$



b



$$a^2 - b^2 \equiv (a - b)(a + b)$$

Project 4: The Königsberg Bridge Problem: An Investigation

Age group: 13 -14 year olds

Duration: Four to five 45 minute sessions

Objective: Help children investigate a mathematical problem in the guise of a puzzle and introduce them to the idea that a different representation or approach can lead to new insights. Also reinforce the need for proofs in mathematics.

Introduction:

The river Pregel flows through the town of Königsberg . It has seven bridges (B1, B2, ... B7) laid out like this:

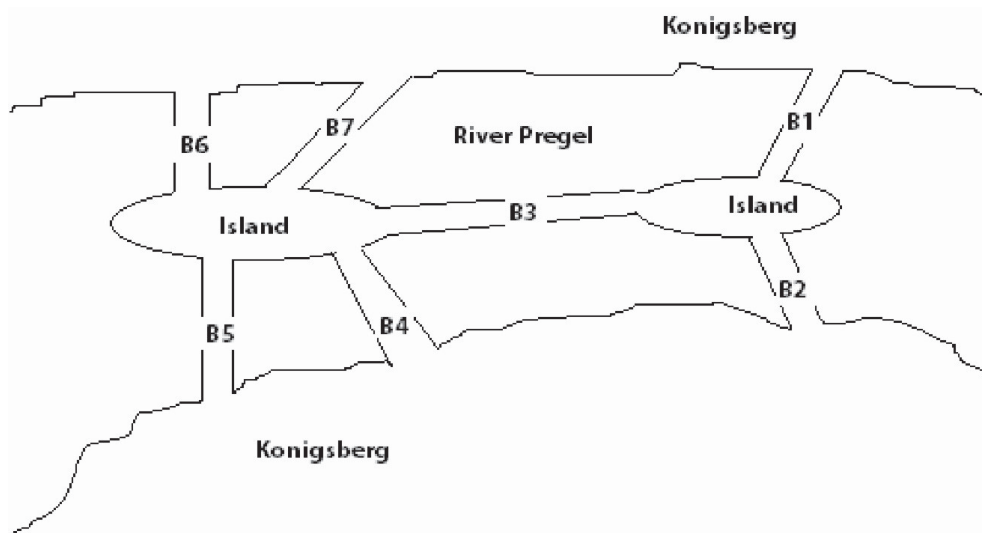
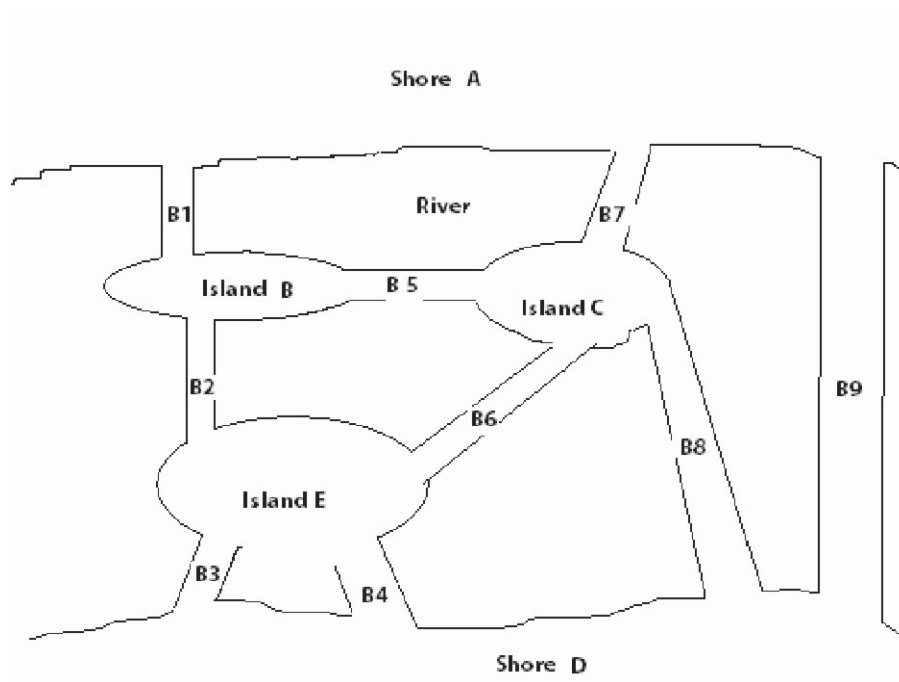
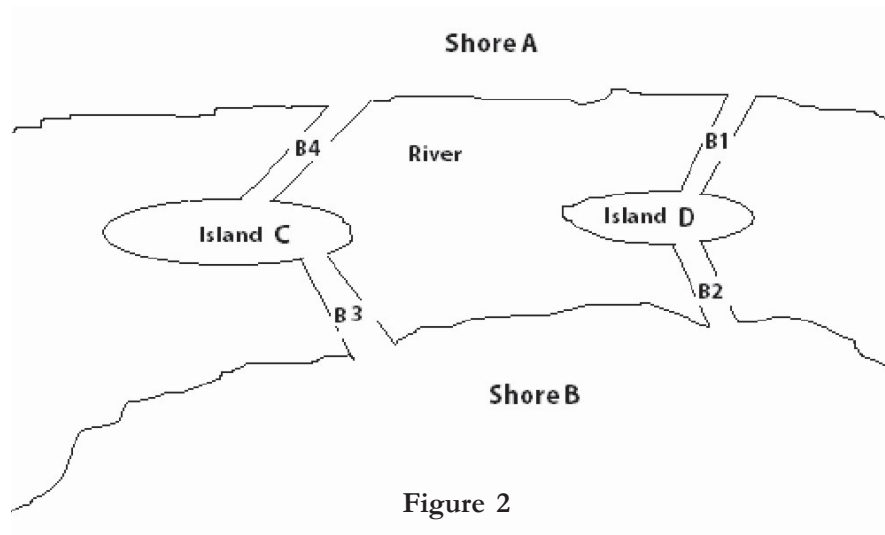


Figure 1

The people in the town wondered if it was possible to take a walk in the town and cross the bridges once and only once.

What do you think? Try out various possibilities. Record your guess.

Now look at similar towns each of which has a river with bridges and islands. The bridges are marked B1, B2 etc and the islands and shores are marked A, B etc.



We will look at several more such figures, and ask the same question: “Is it possible to take a walk through the town and cross the bridges once and only once?” As you investigate each, fill out the table below:

Figure	Is it possible to cross all bridges once and only once?
Figure 1	
Figure 2	
Figure 3	
Figure 4	
Figure 5	
Figure 6	
Figure 7	

Table 1

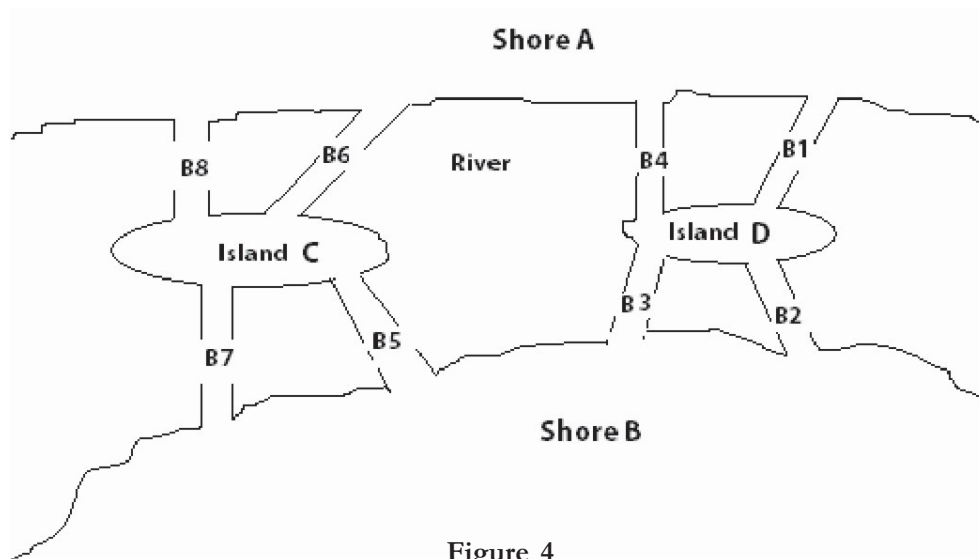


Figure 4

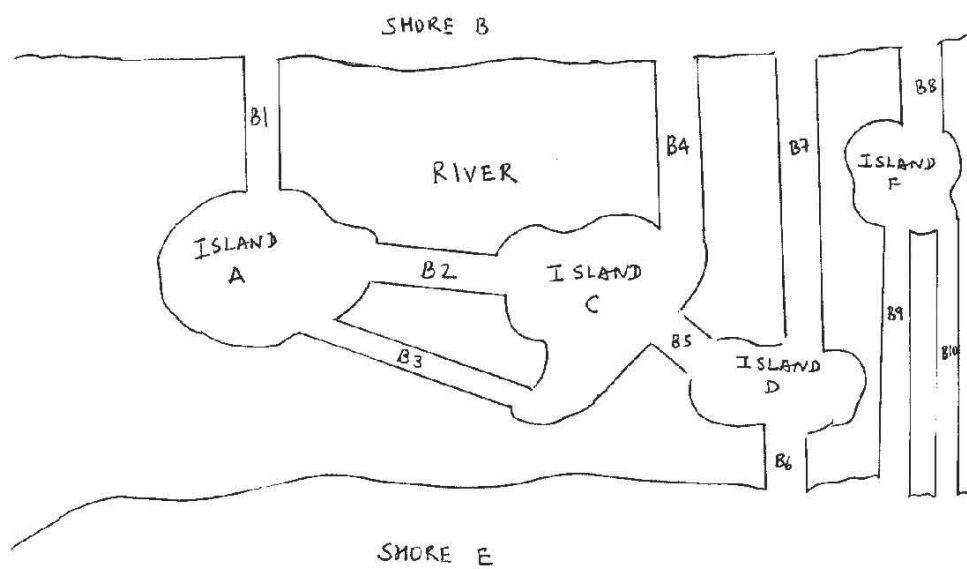


Figure 5

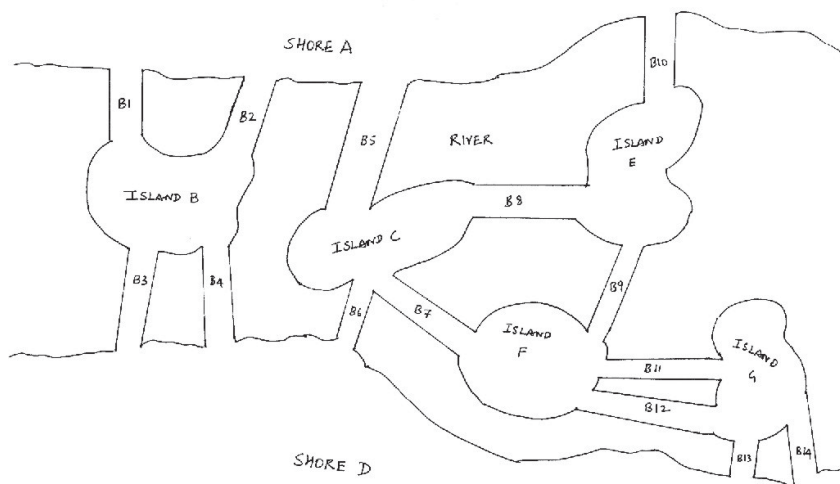


Figure 6

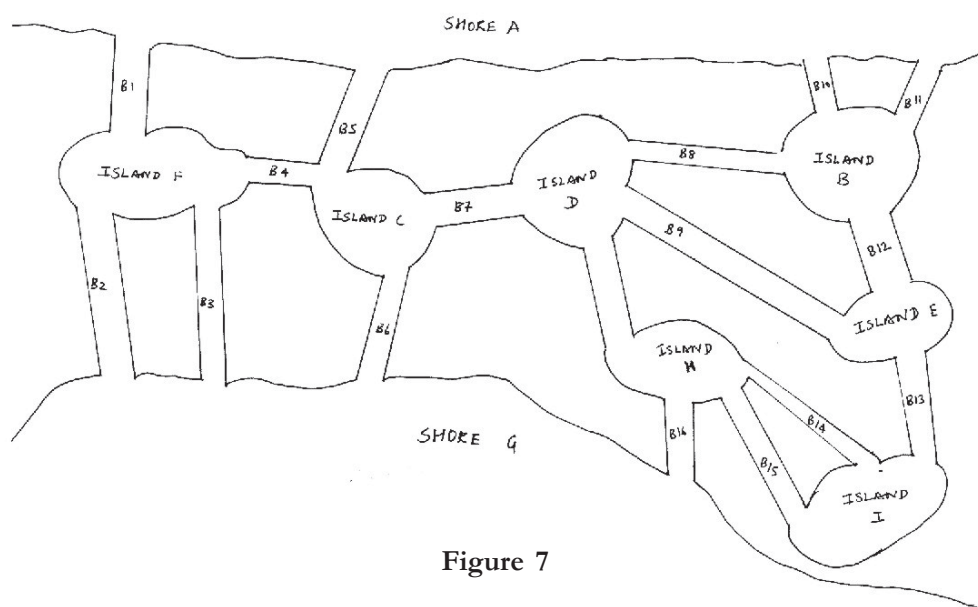


Figure 7

Having investigated the figures above, do you see any patterns? Record them.

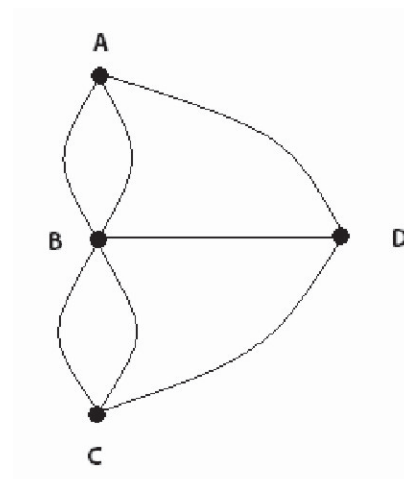
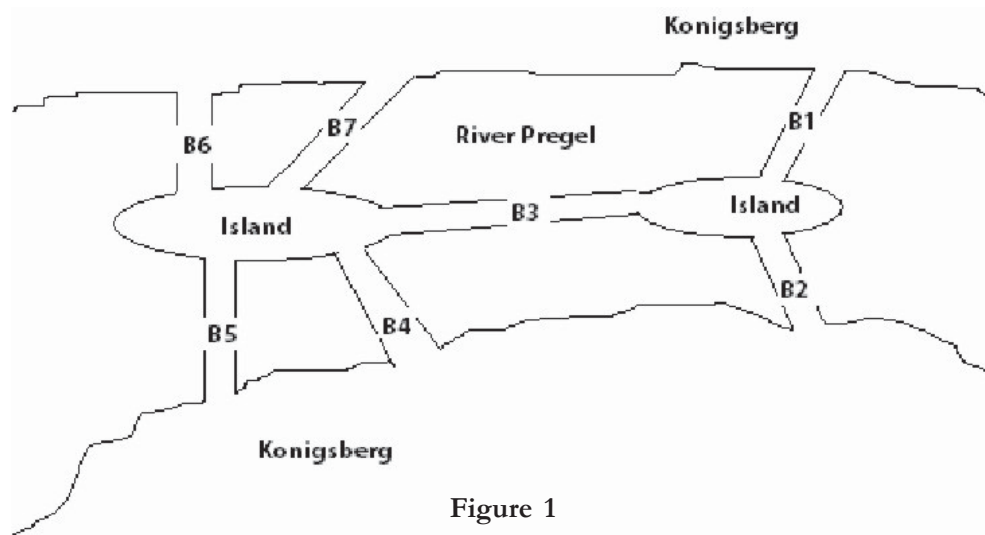
You might have noticed that when you say, yes it is possible to take a walk through the town by crossing each bridge once and only once, to justify the answer you need only demonstrate one such path and you are done. However, if you feel it is **impossible** to take a walk through the town by crossing each bridge once and only once, you have to work much harder to justify your answer. The problem is that there may be a path you have not thought of yet. So we need a ‘proof’ or a way of justifying our answer so that we can convince everyone, using only our powers of reasoning, that our answer is correct.

Euler’s Trick:

In 1736 Euler discovered a solution that could answer the question “Is it possible to take a walk through the town and cross the bridges once and only once?” not only for the above figures but for any town with bridges and islands.

Euler is considered one of the greatest mathematicians ever. He was incredibly prolific and published over 800 papers in his life time. In solving the Königsberg Bridge Problem, he created two new branches of mathematics – Graph Theory and Topology, which are now an integral part of modern mathematics.

To solve the problem he started with the following trick. He converted Figure 1 into a graph (see Graph 1)



Graph 1

A graph consists of vertices and edges. What Euler did was to collapse each shore or island to a vertex. So for example the shores on either side of the river Pregel are vertices A and C and the two islands are vertices B and D. If there is a bridge between land masses they are represented by an edge to obtain the above graph. He also noted the number of edges from each vertex. Why don't you convert each of the figures above into graphs and make a table listing the number of edges for each of the graphs. The table for Figure 1 is given below.

Vertex	No of edges
A	3
B	5
C	3
D	3

Table for Graph 1

Do you see any pattern? After many attempts and comparing your answers with your friends' answers your entries for Table 1 should be as follows:

Figure	Is it possible to cross all bridges once and only once ?
Figure 1	No
Figure 2	Yes
Figure 3	Yes
Figure 4	No
Figure 5	Yes
Figure 6	Yes
Figure 7	Yes

Now look at the tables associated with the figures where you have said it is possible for one to travel through the town crossing a bridge once and only once. Do the same for the ones where you have said it is not possible. Any ideas?

Here are some questions that may help you with your investigations:

(i) Identify the graphs which have tables where each vertex has even number of edges. You must have said it is possible to traverse the town satisfying our conditions. Can you explain why?

Do you think all graphs which have vertices with even number of edges can be traversed satisfying our conditions? Can you justify your answer?

(ii) Now look at the graphs for which you said 'yes'. Do all have even edges for each vertex? If no, is there any pattern for graphs with odd edges at vertices? If you have found a pattern then can you justify your answer?

Let us summarise our observations and put them down as a Theorem.

Observation 1: All towns whose graphs have even number of edges at each vertex can be traversed in such a way that one crosses each bridge once and only once.

Observation 2: All towns whose graphs have exactly two vertices with odd number of edges and all other vertices have even number of edges can be traversed in such a way that one crosses each bridge once and only once.

Definition 1: A graph is an **Euler graph** if there is a path on the graph using each edge once and only once.

Theorem 1 (Euler): A graph is an Euler graph if it satisfies any one of the following two conditions:

(i) if there are even number of edges at each and every vertex

(ii) If there are exactly two vertices with odd number of edges and all the rest are even.

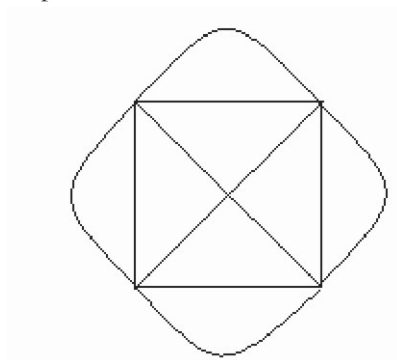
Proof: Suppose there is a path that goes through the graph using each edge once and only once.

Then for all edges except the starting and ending vertices you arrive by an edge and leave by an edge. This means all vertices that are not starting and ending vertices *must* have an even number of edges.

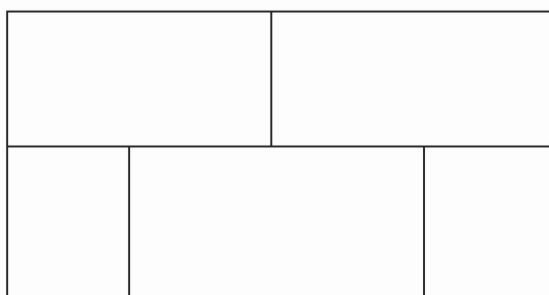
But for the starting and ending vertices, either both must have even number of edges, or both must have odd number of edges. ■

The same technique can be used to solve the following problems:

1. Can you trace the following figure without removing your pencil from the paper or going over one path more than once?



2. Can you draw a curve which crosses each edge of the following figure exactly once?



Bibliography

David W. Farmer and Theodore B. Stanford, *Knots and Surfaces: A Guide to Discovering Mathematics*, University Press (India) Limited, Hyderabad, 1998.

H.R. Jacobs, *Mathematics a Human Endeavor*, W.H. Freeman and Company, San Francisco, 1970.

Joseph Samuel, Crossing Bridges, *Resonance: Journal of Science Education*, Vol. 4 Number 1, January 1999.

Y2 (SMP 11 -16 Series), Cambridge University Press, Cambridge, 1985.

Appendix: Tables and Graphs for Figures 2 - 7

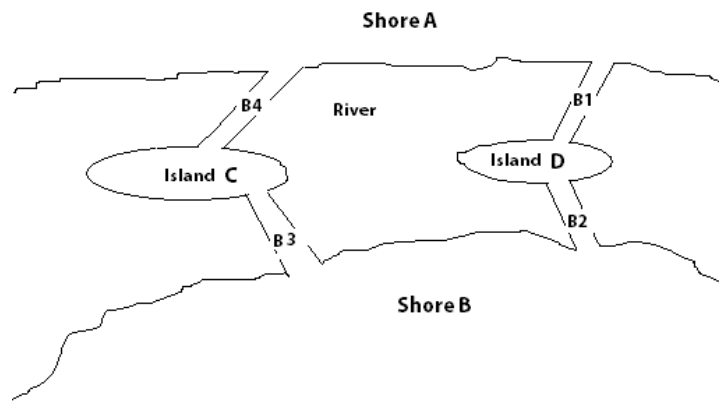
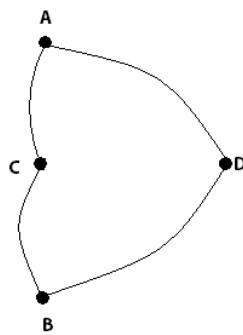


Figure 2



Graph 2

Vertex	No of edges
A	2
B	2
C	2
D	2

Table for Graph 2

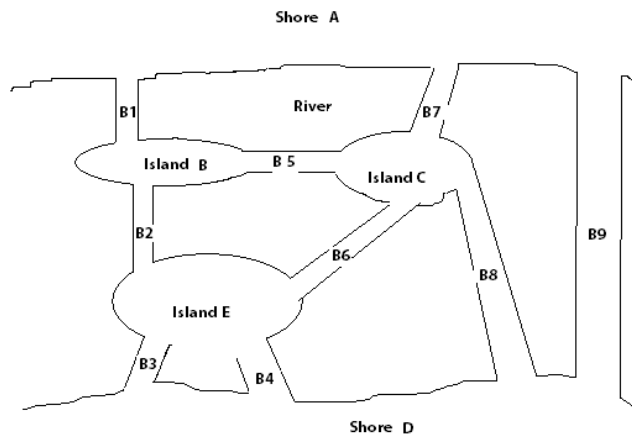
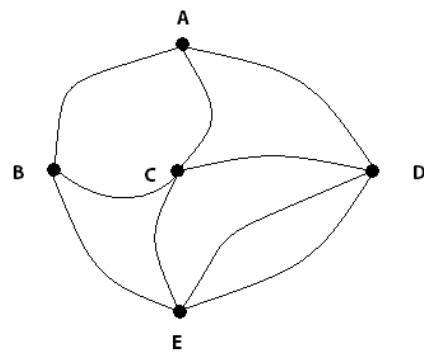


Figure 3



Graph 3

Vertex	No of edges
A	3
B	3
C	4
D	4
E	4

Table for Graph 3

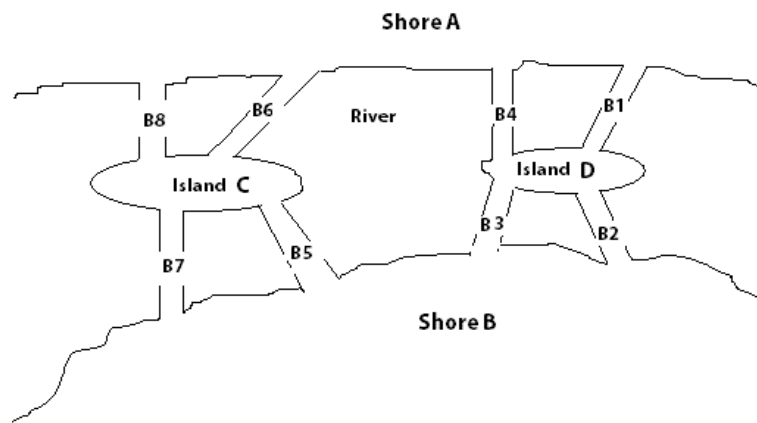
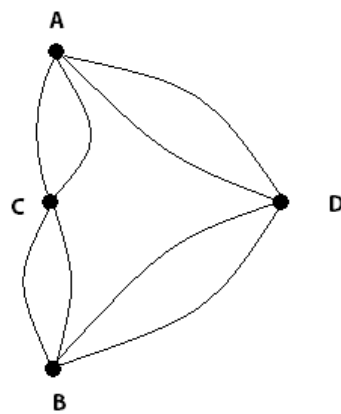


Figure 4



Graph 4

Vertex	No of edges
A	4
B	4
C	4
D	4

Table for Graph 4

