

SPECIAL ORIENTATION PROGRAMME
for
PRIMARY SCHOOL TEACHERS
(SOPT)

A firsthand experience
Dr. N.M. Rao



REGIONAL INSTITUTE OF EDUCATION
MYSORE - 570 006
[NATIONAL COUNCIL OF EDUCATIONAL RESEARCH
AND TRAINING, NEW DELHI - 110 006]

ACKNOWLEDGEMENT

I am grateful to Prof. A . N . Maheshwari, Joint Director (NCERT), who gave a careful hearing to my suggestions to improve the SOPT programme. He has shown a lot of interest and guided me to put the suggestions on record.

I would like to thank Prof. S.T.V.G.Acharyulu and Prof. D. K . Bhattacharjee for the financial help and encouragement in bringing out this report.

It is my pleasure to thank my colleagues and all members of the training camp who cooperated with me in my attempt to improve the Primary Education.

REGIONAL INSTITUTE OF EDUCATION (NCERT)

MYSORE - 570 006

Training Programme for Primary School Teachers

(SOPT - Third Level)

12-09-1995 to 18-09-1995

Venue : Guru Bhavan, Nanjanagud, Mysore District.

Medium of Instruction : Kannada

**The team : Dr.N.M.RAO - Course Director.
Reader in Mathematics RIE Mysore.**

**Resources Persons - Mr. K.Ganapathy Bhat
PGT DMS**

**- Mr. Y.Kappanna
PRT DMS**

**- Smt. T.V.Lalitha
PRT DMS**

**- Smt. Parvathamanni
PRT DMS**

Course Director's Report

The Regional Institute of Education or the NCERT does not directly conduct the SOPT - Third Level Training Programme (Special Orientation for Primary Teachers). They train the Key Persons of the States. The Key Persons train the Resource Persons and then the Resource Persons in turn train the Primary Teachers.

But the NCERT decided that the Regional Institute of Education, Mysore would directly conduct two Third-Level training camps under SOPT for this year as sample cases.

(i) The first training camp was for the Primary teachers working in the urban area of Mysore city. This camp was conducted at Krishnaraja Balika Higher Primary School, Lakshmipuram, Mysore-4 between 18-08-95 to 24-08-95. Sri P.Ramachandra Rao (RIE Mysore) was the course director of this camp. The report of the first camp is available separately.

(ii) The second training camp was for the Primary school teachers working in the rural areas of Mysore district. This camp was held at the Guru Bhavan, Nanjanagud between 12-09-95 and 18-09-95. All the participants were the primary school teachers working in the remote villages of the Nanjanagud Taluk (Mysore District). Dr.N.M.Rao (RIE Mysore) was the course director.

This is the report of the above mentioned camp held at Nanjanagud.

Purpose: The purpose of conducting these camps directly by the RIE (NCERT) was to obtain the feed-back so that a model training strategy for Primary Teachers could be developed.

Focus: The main focus of the SOPT Programme is to implement the Minimum Levels of Learning (MLLs) identified for Primary stages and to train the teachers in the use of Operation Blackboard (OB) materials provided to schools. The SOPT was launched in the year 1993-94 and it is expected to cover nearly 4.5 lakh primary school teachers every year.

The Participants: A total of 48 Primary school teachers (36 Female and 12 Male), working in different interior villages of Nanjanagud Taluk attended the programme. They travelled daily from their villages to Nanjanagud. They covered the distance ranging 5 kms. to 30 kms. every day to attend SOPT. Sri Siddappa, Block Education Officer, Sri. Sangappa, Education Officer in the office of the BEO were present as observers for the entire period of the programme. Some faculty members from the DIETS of Mysore, Mandya and Chikkamagalur also attended this programme to gain experience to conduct SOPT programmes in their institutions. The list of the participants who attended the SOPT is given at the end. The participants were selected by the BEO Nanjanagud.

Day's Schedule: Even though the camp was supposed to be between 9.00 am and 5.00 pm, this time schedule could not be strictly adhered to in view of the participants reaching the camp late. Some teachers had to walk about 2-3 kms to catch their buses. Therefore the camp schedule was changed to 10.00 am to 5.00 pm with fifteen minutes break for tea and 30 minutes break for lunch. Owing to the lack of funds, only tea was served to the participants. The teachers had to make their own arrangement for lunch.

Physical facilities: The Guru Bhavan, where the programme was conducted was spacious and it comfortably accommodated all the participants. Folding type steel chairs were available for the teachers. The black board, table and chair with other facilities

were available. Another attraction of this venue was that it is situated inside a school compound. The two nearby government schools (Dalvayi school for boys and Chinnamma school for girls) came on handy for conducting practical activities. The play ground was available for conducting health and physical education practical classes. The park with water channel was used for taking teachers and children for nature walk. The power-supply was available but unfourtunately there were many power-cuts.

Availability of Print Material: The state authorities could not supply needed print materials at the appropriate time. Therefore no print material was made available to the participants. However Kannada version of the MLL Book was Xeroxed and the copies were used in the group work in each subject area. The participants were provided with the Kannada versions of the following cyclostyled materials.

- (i) Methods of inspecting the personal hygiene of Primary school children.
- (ii) Work Experience in Primary schools.
- (iii) Description and uses of the seven items given in the Maths Kit.

Availability of OB Material: The Maths Kit from DM School (RIE Mysore) was taken to the camp and used in the training programme. Since many teacher participants were already trained in the use of Science Kit and Tool Kit, there was little scope for repeating the same. However the Science Kit was used during the science sessions. Globe, maps and charts which were taken from RIE, were used in the training camp.

ETV Support: The VCR and the TV were hired locally to screen the following films :

- (i) Looking at learning - Part - I
- (ii) Looking at learning - Part - II
- (iii) Art Education

The cassette of the above three films was of very poor quality and watching the above films was not a happy experience. Therefore the video versions of the actual class room situations (produced during the programme) were shown.

Video Production: The Principal RIE had sanctioned an additional amount of Rs.2000/- (Rupees Two Thousand) for the purpose of video recording of the complete programme. The following sessions were video graphed by taking the help of a local studio person (Bimba studio) : The inaguration session, four group-work sessions, five class room sessions with activities, the art and crafts/work experience session, the physical education/games classes and the closing function. The cassettes of the above are available at Delhi with the SOPT programme coordinator. The total expenditure of video graphy did not exceed the sanctioned amount.

ALTERNATIVE MODEL OF SOPT: As per the Training Manual for the SOPT programme, the main focus is to -

- 1) Provide competencies on MLL.
- 2) Develop competencies on the use of OB Materials.
- 3) Encourage teachers to adopt child centered approach.

4) Encourage participation of trainees with focus on skill and activity based teaching learning process.

But the same focus is not made clear in the time table given in Appendix B of the SOPT Manual. There is no provision for the teachers to practise in the presence of Resource persons what they have learnt during the 7 days training programme. If the participants are made to teach in class rooms by adopting the above mentioned points, they will feel that this programme is useful. If the SOPT programme is considered only as an Awareness Programme, there is every chance that the teachers may not find it quite useful. Therefore, the SOPT programme conducted at Nanjanagud was modelled in such a way that it could be both Awareness and Training Programme.

The suggestions to improve the SOPT Programme are given separately in the end. Every participant could not get a chance to do the teaching practice in the actual classroom within this short period of 7 days. But at least one person from each group could teach a subject to the children for about 20 - 30 minutes, without deviating much from the time table given in the manual. Now we give the actual transactions in the day-today sessions.

Transaction During Sessions

The first day: The general awareness on MLL, child centred activity based education, continuous comprehensive evaluation and the different competencies to be mastered at different levels, were discussed on the first day. There was no general lecture on any topic, and the concepts were made clear to the teachers by means of discussion only.

The following probing questions related to introspection were asked :

- 1) Have I done anything to see that every child in the class learns everything that I have taught ?
- 2) Have I done anything to see that every child is interested in my class and the school atmosphere ?
- 3) Have I done anything to verify whether the child has really learnt anything in the school/class ?

Every teacher was asked to answer the above questions in not more than five sentences, read out the answers in the class and discuss their relation with MLL, child centred/activity based learning and continuous comprehensive evaluation. At the end of the day the participants described the ways of preparing the assessment cards of comprehensive and continuous evaluation (Area-wise) and the need to create climate for effective teaching - learning (Developing school Readiness) situations.

Second day onwards: From the second day onwards, there were five sessions on Mathematics, five for Kannada, four sessions on EVS

II (Science), three sessions on EVS I (Social Studies), one for health and physical education, two for art education, two for SUPW and one for multigrade teaching. The following procedure was adopted in each subject. Taking the example of one competency in a subject, the resource person demonstrated how to develop that competency in the class room through different activities. Afterwards, the participants developed different activities on different competencies in the group work sessions. Each group was asked to present its activity. These activities were then tried out in the class by taking the help of three neighbouring schools. This procedure was repeated in the subjects Mathematics, Kannada, EVS I and EVS II. In total there were six actual class room sessions. All these sessions were video graphed.

Language (Kannada): At the Primary Stage, the main objectives of Language teaching are to :

- be able to listen with understanding;
- be able to speak effectively in both informal and formal transactions;
- be able to read with comprehension and enjoy reading various kinds of instructional materials;
- be able to write neatly, with logical sequence and creativity;
- be able to comprehend ideas through listening and reading;
- be able to use grammar functionally in various contexts.

The resource person for Kannada Language explained the meaning of above objectives in accordance with the competencies given in the MLL book.

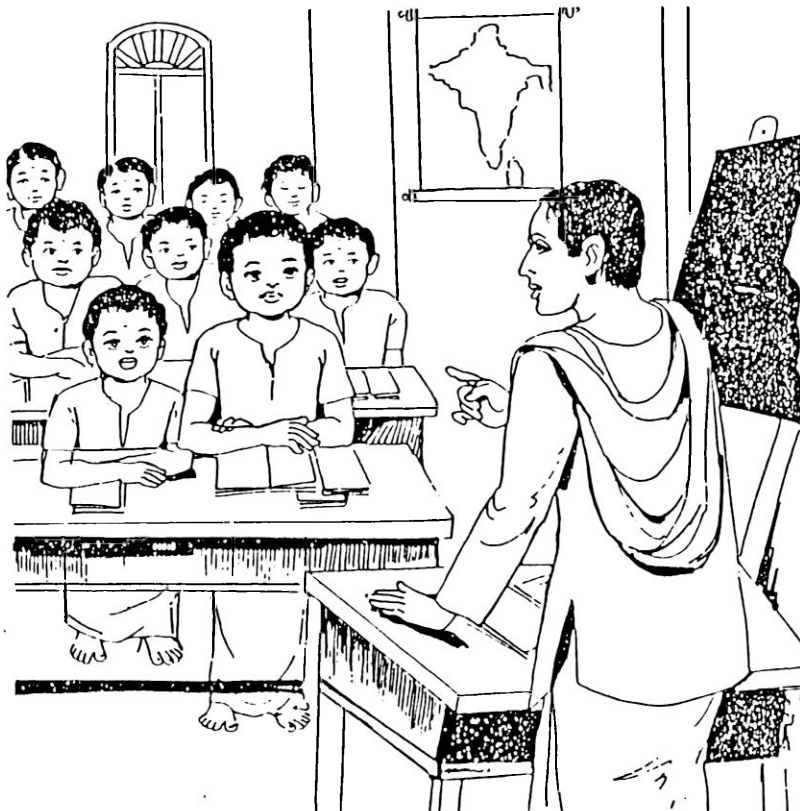
(example : Listening 1.1.1, speaking 2.1.1, etc.,). The teachers were asked to develop the proper activities for acquiring the competencies. Also, they developed the instructional materials like charts, flash cards and other teaching aids, in groups. Dr. H.K.Ramanath was called for one session as a guest lecturer. He demonstrated the importance of "story telling" by actually doing it in the class room

Story Telling

By Dr. H.K.Ramanath

The Story: A crow was sitting on a tree with a piece of flesh in its mouth. A fox wanted to get the piece of flesh from the crow. It made a plan to praise the crow. The fox requested the crow to sing a song. The wise crow kept the flesh below the feet and sang 'ka ka ka'. The fox could not get the flesh. It became unhappy and went away.

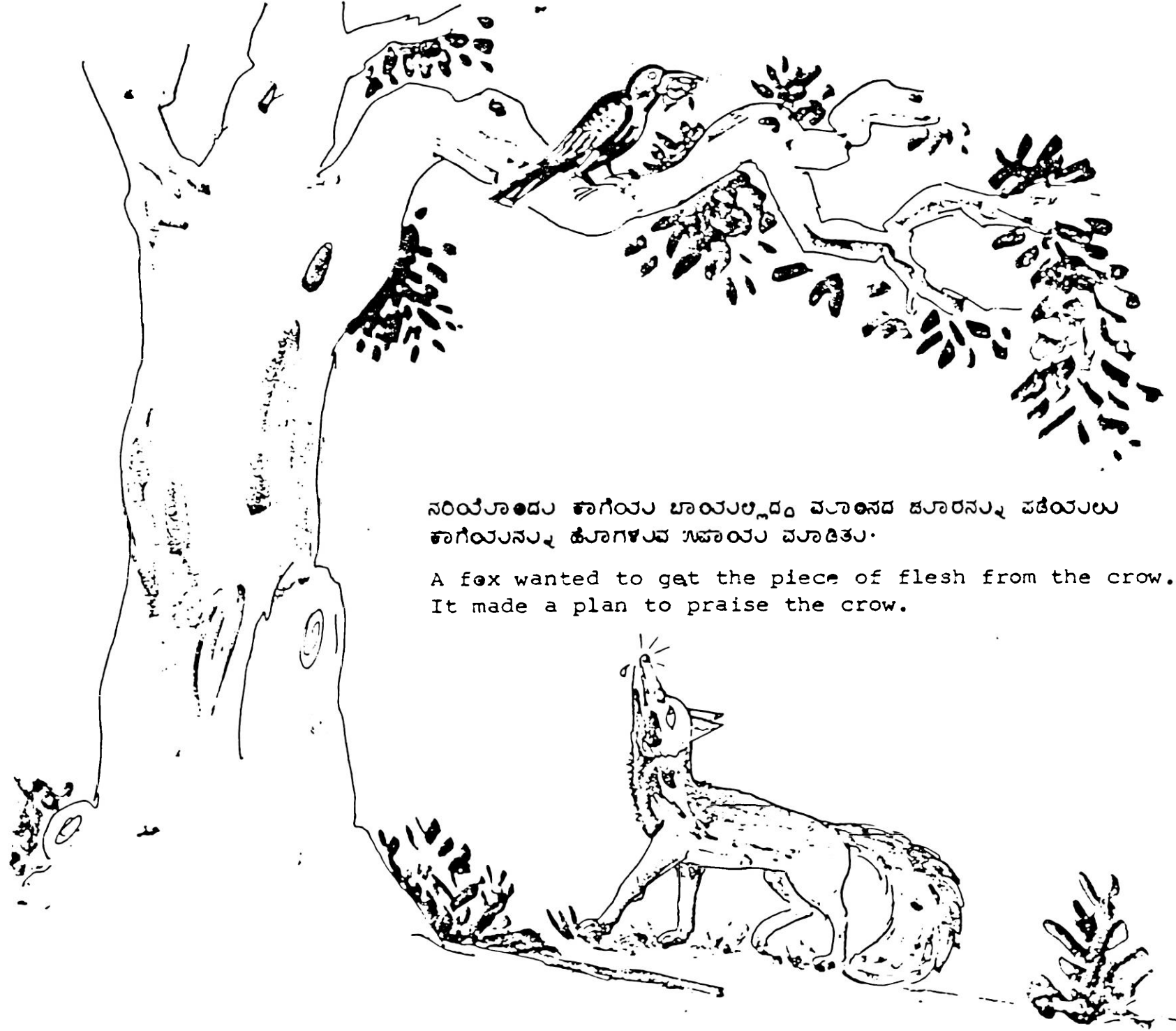
The above story was enacted with the help of pictures. The evaluation questions and the story pictures are enclosed. (This session was video graphed).





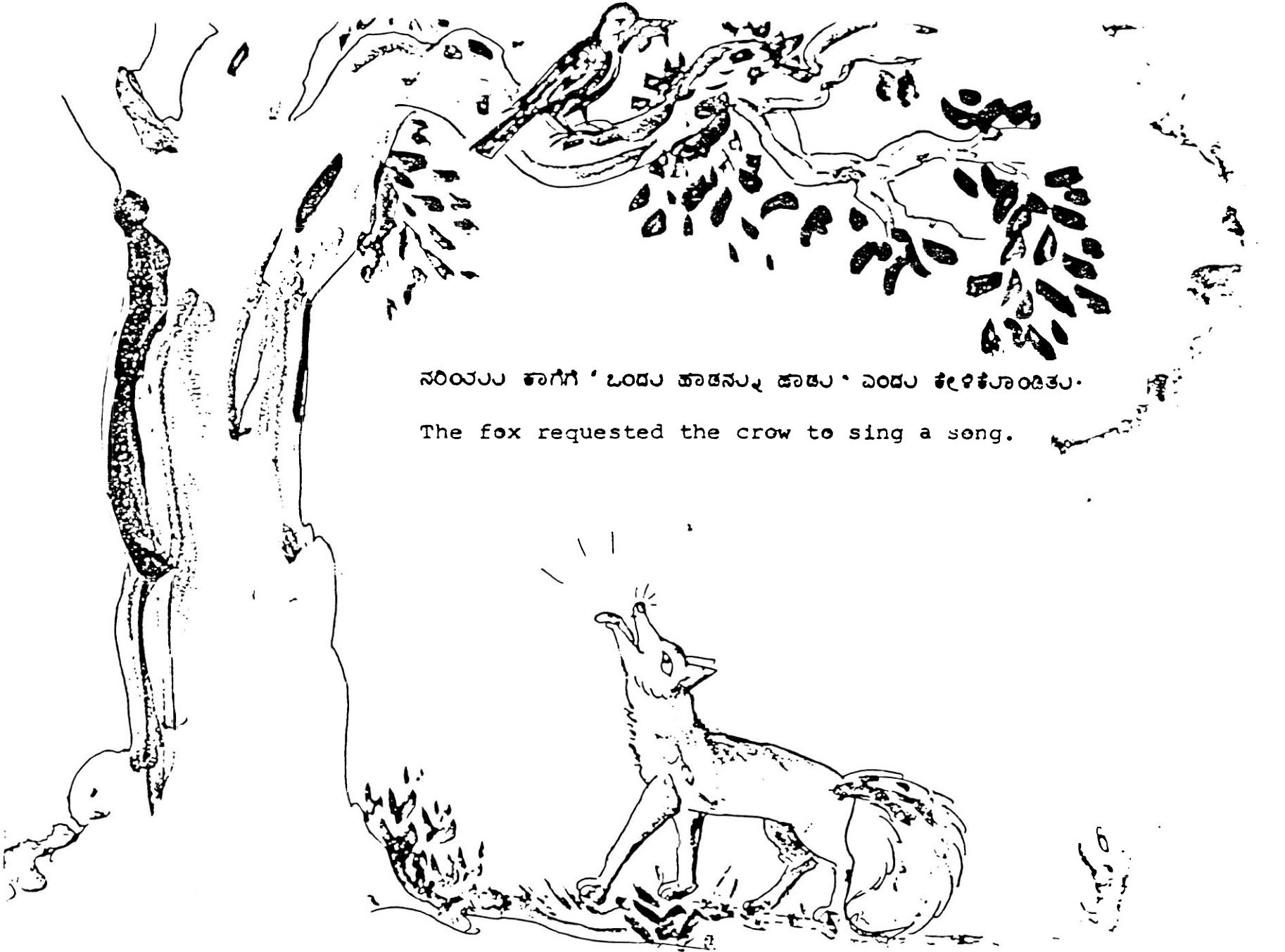
ಕಾಗೆಯೊಂದು ಮೂವನದ ಜಾರನ್ನು ಕಡ್ಡಿಕೊಂಡು ಮರದ ಮೇಲೆ ಕುಳಿತು.

A crow was sitting on a tree with a piece of flesh in its mouth.



ನರಿಯೊಂದು ಕಾಗೆಯ ಬಾಯಲ್ಲಿದ್ದ ಮಾಂಸದ ಜಾರನ್ನು ಪಡೆಯಲು
ಕಾಗೆಯನ್ನು ಹೊಗಳುವ ಉಪಾಯ ಮಾಡಿತು.

A fox wanted to get the piece of flesh from the crow.
It made a plan to praise the crow.



ನರಿಯು ಕಾಗೆಗೆ ' ಒಂದು ಹಾಡನ್ನು ಹಾಡು ' ಎಂದು ಕೇಳಿಕೊಂಡಿತು.

The fox requested the crow to sing a song.



ಬುದ್ಧಿವಂತ ಕಾಗೆಯು ಮೌನದ ಜಾರನ್ನು ಕಾಲನ ಅಡಿಯಲ್ಲಿ
ಸಿಕ್ಕಿಸಿಕೊಂಡು 'ಕಾ ಕಾ ಕಾ' ಎಂದು ಕೂಗಿತು.

The wise crow kept the flesh below its feet
and sang 'Ka Ka, Ka'.



ನರಿಗೆ ಮಾಂಸದ ಜಾರು ಸಿಗಲಿಲ್ಲ. ನಿರಾಶೆಯಾಗಿ
ಹೊರಟುಹೋಯಿತು.

The fox could not get the flesh.
It became unhappy and went away.

Mathematics:

In the first session, the participants were made familiar with the items given in the Maths Kit. There are seven items in the Kit. The teachers handled all the items themselves and had the first hand experience of the Kit. The list of items in the Maths Kit and their usages is enclosed separately (it is in Kannada). The teachers were made clear about the ways in which the Maths Kit could be used in the class room. Also, the teachers could list the locally available other materials which could be used in the class room in the absence of the Maths Kit.

The second and the third session were the group work sessions. All the participants were divided into eight groups. Each group was given a specific competency in Mathematics. For example the competencies 1.1.1 to 1.1.6 understanding the numbers; 2.1.5, understanding the symbols + - and =; 5.1.2 to 5.3.2 understanding the geometrical shapes; 4.3.1 to 4.3.2, fractions, etc., were given to different groups. Each group discussed thoroughly and brought out some child centred activity through which the given competency could be developed in the class.

All the groups reported their activities to the full class in the fourth period. Every participant took active part in the discussions about the reported activities. They discussed the feasibility of such an activity in the class room. Atleast one of the activities was selected for actual demonstration in the school. The teachers made plans and preparations for that demonstration lesson.

The actual demonstration took place in the fifth period. There was sufficient time for the teachers to bring teaching aids, charts and other materials because the fourth and fifth periods were on different days. One such Mathematics Demonstration is given below in brief :

Competency 1.1.3 (concept of zero)
and 1.1.6 (descending order numbers).

The teacher selected ten children and brought them near her table. They sang the following song with the teacher (The song is in Kannada and the meaning is given here)

"I have ten birds with me, one flies away, how many are left ? "

"Nine are left" $10 - 1 = 9$

"I have nine birds with me, one flies away, how many are left ?"

..... $9 - 1 = 8$

.....

.....

Every time, when the bird flies away in the song, one child was asked to act like a bird and fly away. In the end -

"I have one bird with me, one flies away, how many are left ?"

"None" $1 - 1 = 0$

"Zero birds are left with me"

After the drama, the whole class was asked to sing that song completely. They were asked to tell the numbers in the descending order :

10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.

In the end, the evaluation was done with the help of following type of questions :

$$5 - 1 = ? \qquad 7 - 1 = ?$$

$$3 - 1 = ? \qquad 1 - 1 = ?$$

Arrange the following numbers in the descending order :

$$3, 6, 4 \qquad 3, 4, 6$$

$$3, 2, 5 \qquad - \quad - \quad -$$

$$3, 2, 1 \qquad - \quad - \quad -$$

$$5, 6, 1 \qquad - \quad - \quad -$$

The above teaching session was video graphed. The actual demonstration was for about thirty minutes. So, the participants had the time afterwards to discuss the ways in which the demonstration class could be improved.

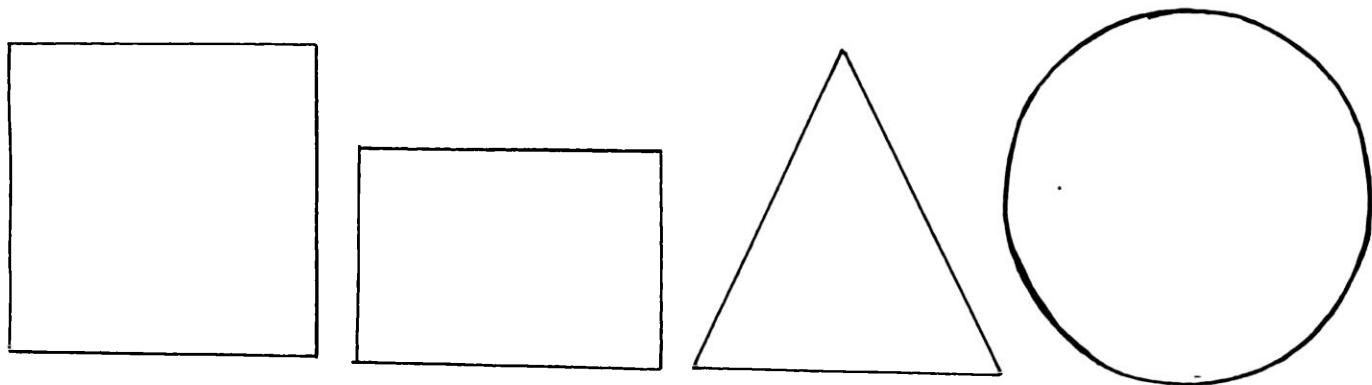
There were two more classes in Mathematics :

- (i) to distinguish the geometrical shapes (Maths 5.1.1)
- (ii) to recognise the solid objects (Maths 5.1.3)

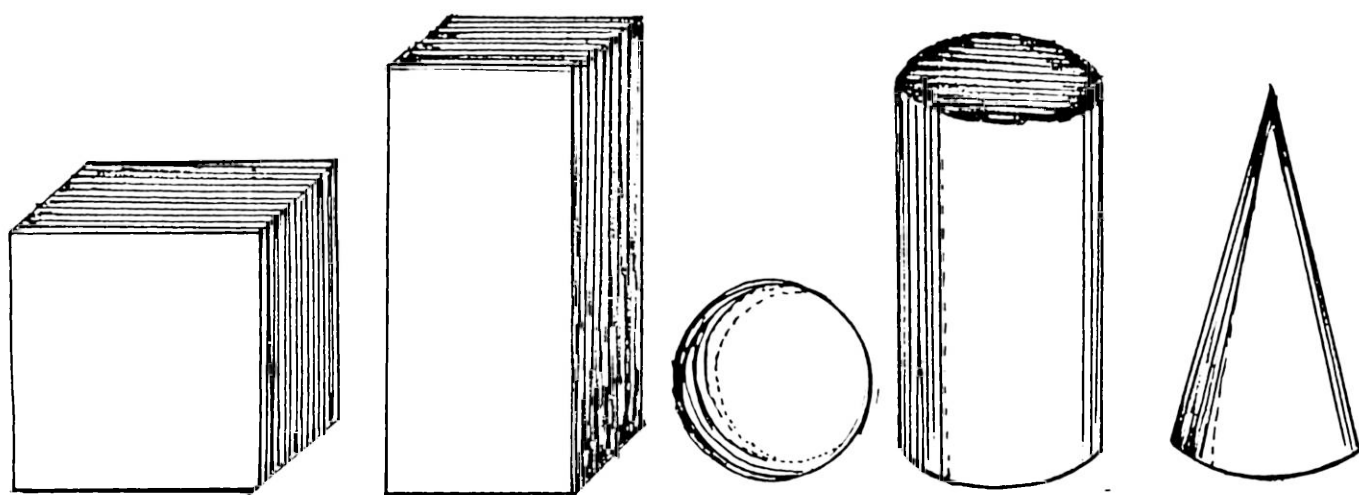
Mathematics - decreasing order - Primary Rhyme .

		$10-1=9$
		$9-1=8$
		$8-1=7$
		$7-1=6$
		$6-1=5$
		$5-1=4$
		$4-1=3$
		$3-1=2$
		$2-1=1$
		$1-1=0$

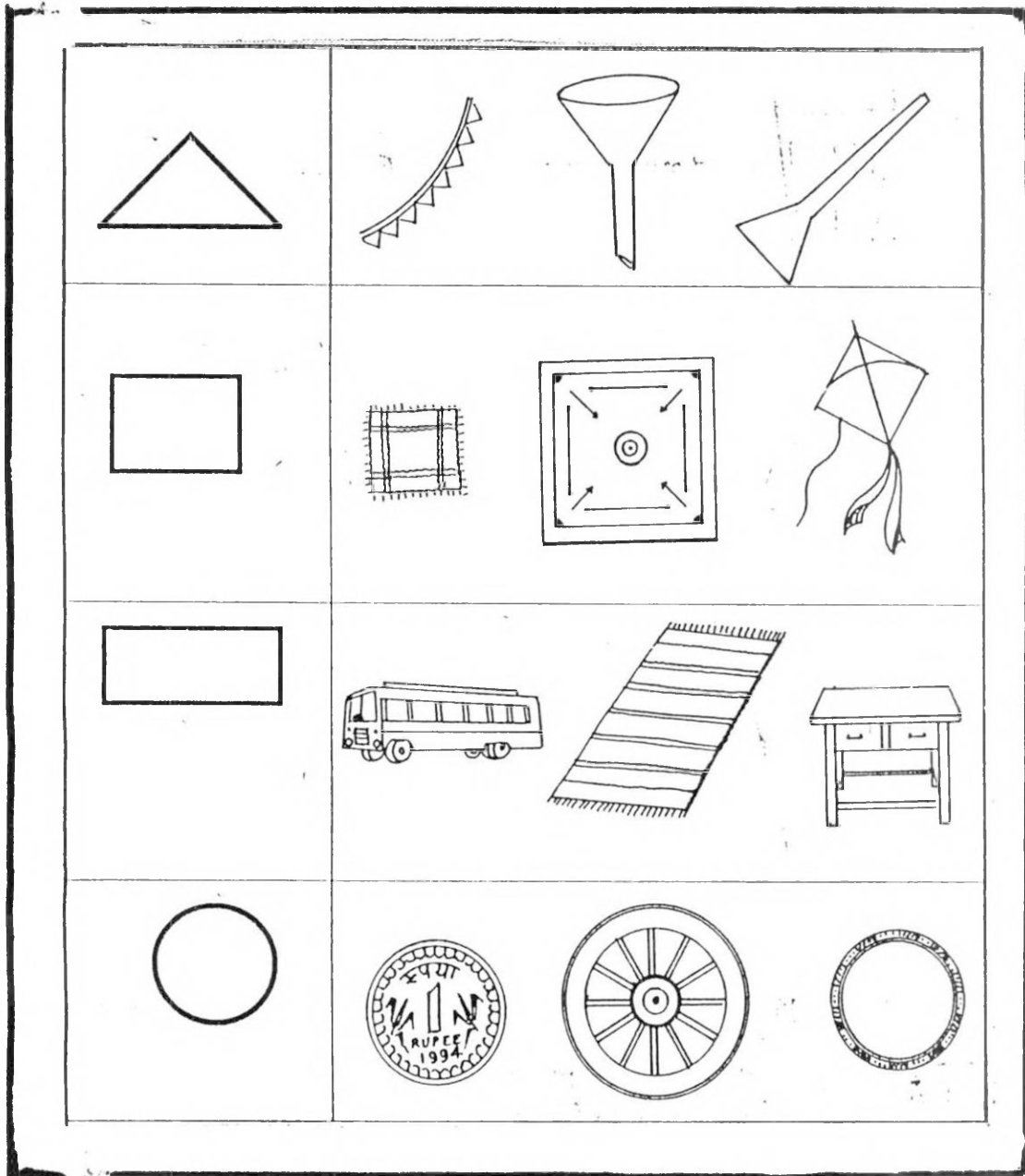
To recognise the geometrical shapes



To recognise the shape of solid objects



Mathematics



5.1.1 Recognize The Shapes.

EVS I (Social Studies)

As per the schedule, the EVS I was provided with three periods; The first was for concept and strategies; the second was for group work and the third was for the demonstration on globe and maps etc.

During the first period the concept of environmental studies, its importance, its scope etc., was discussed. The resource person through proper examples demonstrated activity based and child centred strategies of instruction to the participants. The discussion also covered the purpose and methods of evaluation in the context of EVS - I.

The second period was set apart for group work and presentation of the group work. The participants were divided into six groups. Each group was asked to select a competency related to EVS - I from MLL document and write the details of an activity that they would adopt to develop that competency in their students. They were also asked to list out appropriate evaluation items to test the achievements of the said competency. The activities selected were required to be interesting, meaningful and child centred.

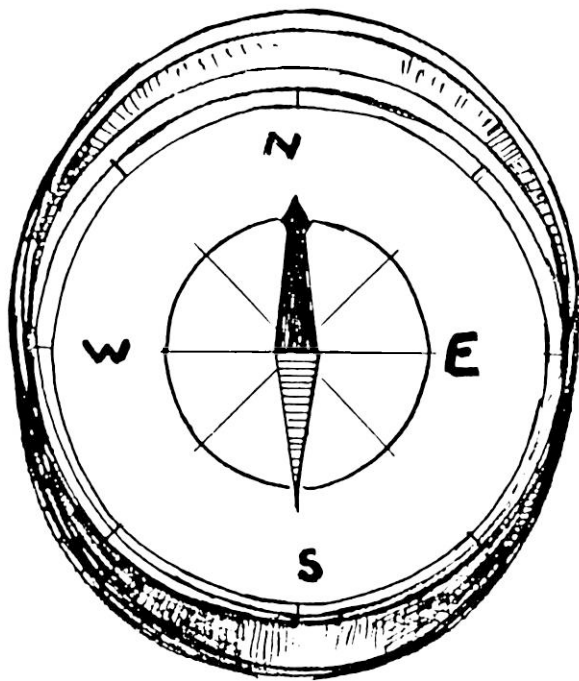
After each group finished its work, the presentation of the group work was done. The participants were given opportunity to discuss the strong and weak points of the activities and evaluation items. They were also asked to suggest improvements.

The third session was set apart to discuss the use of globe and maps. The points discussed in this session were - difference between a map and a globe, types of maps, precautions to be taken while using a map, preparing the maps and charts etc.

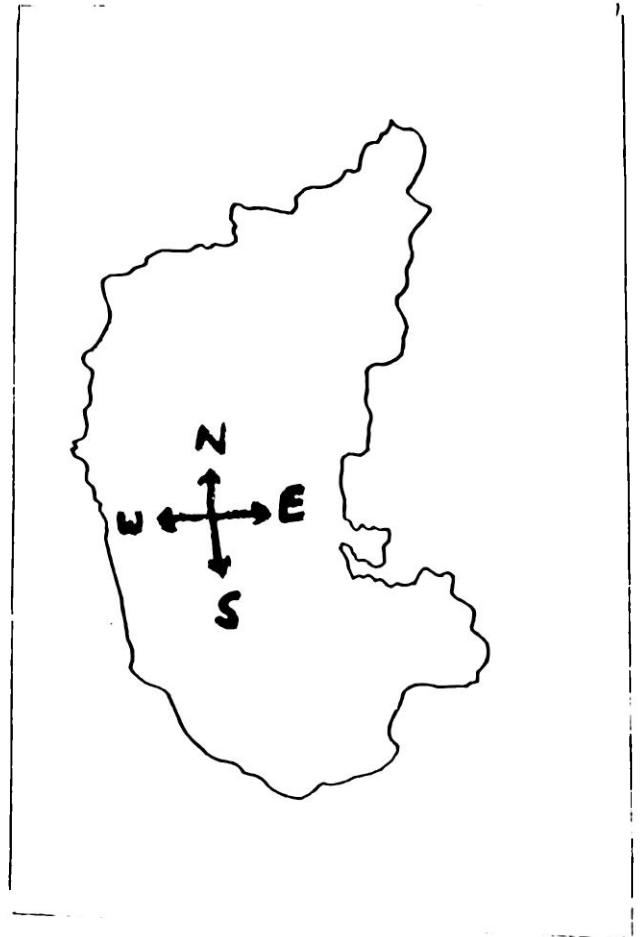
One of the participants demonstrated the activity written by her group in a real class room situation. The competency to identify the directions on a map/sketch map and on Earth (EVS 4.3.2). The students of class 3 were taken outside, and they were helped to identify the directions (East, West, North and South) by the help of the Sun. Also, they prepared the sketch map of their school, located the playground, railway line, the temple, the river and the main road in it. The students could show the directions on the black board by the help of flash cards. The evaluation was done by using the map of India and Karnataka.

Directions

Around the School.



On the Map.



EVS II (Science)

As per the schedule, the EVS II (Science) was also provided with three periods; the first was for concept and strategies; the second was for group work and the third was for nature walk and demonstration. The activities on the first and second periods were similar to the activities done in EVS I (Social). The competencies selected were from the science subjects.

One of the participants demonstrated the activity written by her group in the real class room situation. The competency selected for demonstration was to identify the animals/birds (EVS 8.4.5). The teacher and the students collected several pictures of animals, birds, trees and insects. The children had to classify the animals according to their food habits and living conditions.

It was an example of multigrade teaching also. The first standard students will simply name the animals, while the second standard students will classify them according to their food habits. All children had to name all the animals at the end of the class as a part of evaluation.

ANIMALS WITH THEIR YOUNG ONES

LION CUB



BEAR CUB



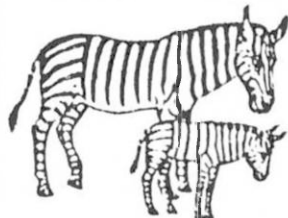
WOLF CUB



TIGER CUB



ZEBRA FOAL



GIRAFFE



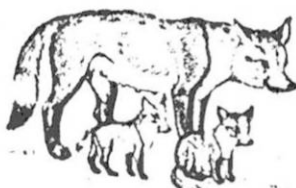
RHINOCEROS CALF



HIPPOPOTAMUS CALF



FOX CUB



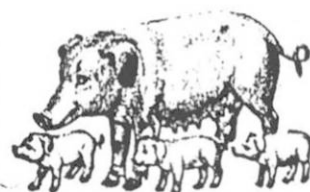
CAT KITTEN



DOG PUP



PIG PIGLET



ELEPHANT CALF



DEER FAWN



KANGAROO PUP



BHARAL



HORSE FOAL



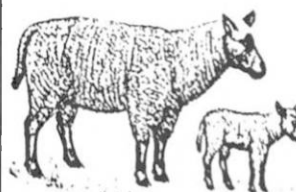
CAMEL



DONKEY FOAL



SHEEP LAMB



COW CALF



BUFFALO CALF



YAK CALF



GOAT KID



HARE LEVERET



RAT



SQUIRREL CALF



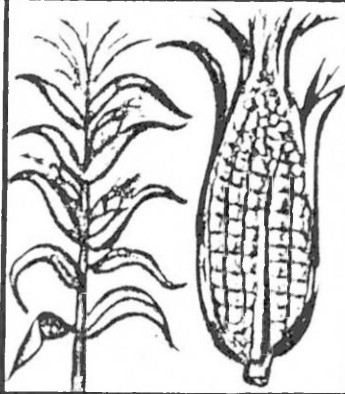
MONKEY CALF



PLANTS CHART



WHEAT



MAIZE



MILLET



RED CHILLI



GRAM



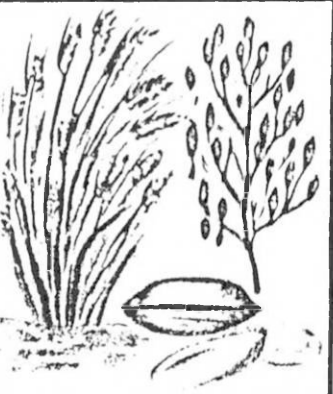
GROUND-NUT



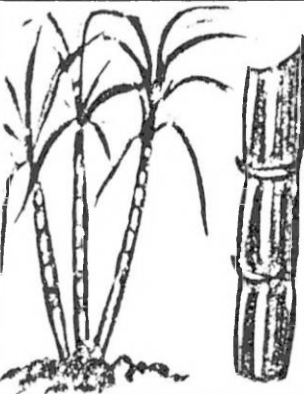
SESAME



COTTON



RICE



SUGARCANE



COCOANUT



TEA



COFFEE



KIDNEY-BEAN



BLACK PEPPER



JUTE

Work Experience

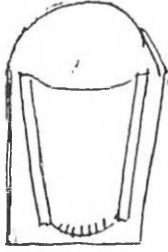
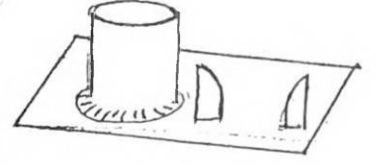
There are about twenty items in the enclosed chart of work experience activities. Some of the items are the national flag, waste paper basket, the tray, envelope, marble painting, bird in the cage, pen stand, etc.

The teachers were given instructions how to prepare these items. Some of the items were demonstrated by the resource persons. The interrelation between work experience and mathematics was also explained. Afterwards, the primary teachers and the children made some of the items by cutting and pasting papers. All the items which were made during the work experience sessions were taken by the teachers to their schools for using them afterwards as teaching aids.

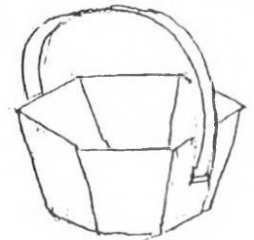
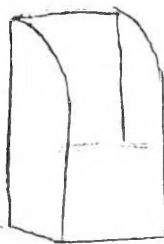
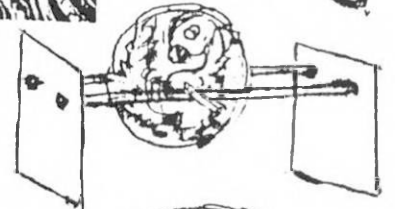
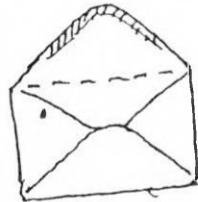
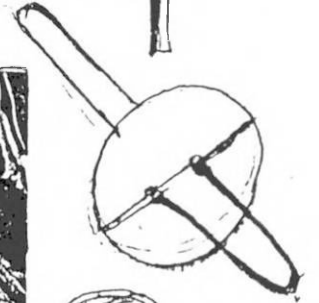
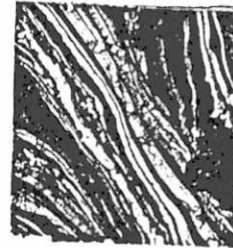
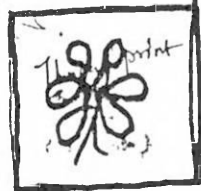
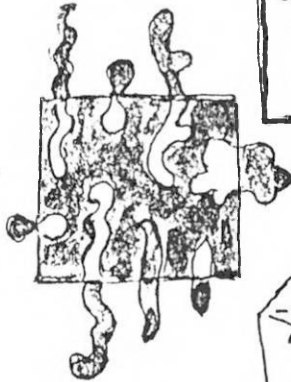
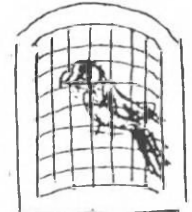
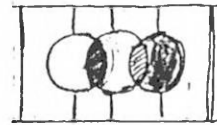
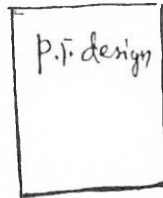
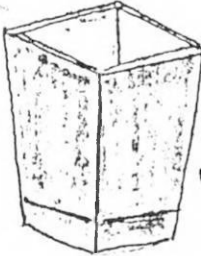
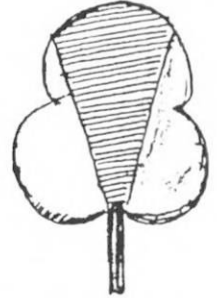
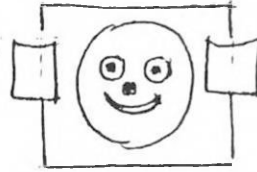
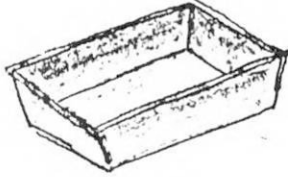
WORK EXPERIENCE ACTIVITIES.



ಕಾರ್ಯಾನುಭವದ ಚಟುವಟಿಕೆಗಳು.



ಬಿ. ಕೆ. ಶಂಕರ ಶೇಖರಯ್ಯ.
ರೀಜನಲ್ ಇನ್ಸ್ಟಿಟ್ಯೂಟ್ ಆಫ್ ಎಜ್ಯುಕೇಷನ್
ಮೈಸೂರು-6.



Art Education

There are many creative impulses which grow in the child quite naturally. Art is also one such creative impulse. The child should be encouraged to express its inherent capabilities through art education. Art education can also be a supporting material to learn other subjects like language, mathematics, etc.

The resource person had shown the importance of

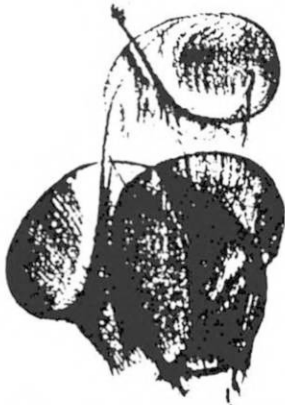
- (i) Pictorial Art (Drawing and painting)
- (ii) Decorative Art (Painting College and Decoration)
- (iii) Plastic Art (Clay-Modelling etc.) and
- (vi) Performing art (Music, Song, Dance, Drama, etc.)

As a part of Art Education, the resource person had demonstrated how to draw the pictures of animals and birds easily. She had also done the thread painting, vegetable prints, finger prints and other forms of art work.

Music, song, dance and drama which are a part of performing art were used by the resource person in mathematics and language classes to show the teachers that the art education is a part of their curriculum also.

ART EDUCATION

by Smt. Parvathammani



Thread printing.



Spray printing.



Collage.



Blow printing.



Blob printing.



Finger printing.



Crumpled paper ball printing.



Vegetable printing.

Multigrade Teaching

All the single teacher schools in Karnataka have been converted into two teacher schools under OB scheme. Therefore there was no necessity of discussing the multigrade teaching practices in a separate period. But, in some villages, there are schools with four classes and two teachers. In this case some type of Multigrade Teaching is Practiced. Therefore some forms of multigrade teaching were discussed in this SOPT programme.

During the demonstration class on EVS II (Science), the children had to separate the animals according to their food habits, living conditions etc. The lower class children were expected to name the animals while the higher class children had to perform more duties. When the children were taken on nature walk also, the two different sets (Class I and Class II) had different duties. For example children of class I had to distinguish plants from trees while Class II - children had to discuss the parts of trees and plants.

Games

Children enjoy playing. This natural instinct has to be directed properly by the teachers to improve the health and all-round development of the children. The above points were made clear by the resource person during the SOPT programme. The resource person demonstrated different types of games which could be introduced in the Primary schools without spending much money.

(i) One of the games was to make children to stand on a circle, one child to run and another to chase the first. But, the condition is that the child who is chasing has to trace the same path of the other child who is running. It improves the skill of escaping, as well as catching.

(ii) In another game, the children were made to stand on a circle. One child will clap thrice and tell its name. The second child will clap and tell the first as well as the second name. The last child will have to tell the names of several children. But these names have been repeated by all the previous ones. This game improves the memory power.

There were other activities like mass physical training (PT), cleaning the school surroundings, health check-up programmes, etc.

Review of the Previous Day's Work :

The review of the previous day's work was done in the first 15-20 minutes time everyday. This procedure helped in the evaluation of the progress in the training programme. It also helped in keeping the record of work done.

Feedback from the participants :

The participants were asked to fill up the questionnaire (without mentioning their names) to give their opinion about the programme. The questions were then analysed. The teachers felt that the time was too short to learn so many things. They were happy that they participated in some actual class room rehearsals.

WHAT CHANGE IS NEEDED ?

1. At present the SOPT programme is considered as only an Awareness programme. It should be understood that the SOPT programme is both Awareness and Training Programme. Hence sufficient importance should be given on the training component. The teachers will find it useful only if all the lectures are deleted and the teaching through activities is increased.

2. At present the training is phased under a mode which is hierarchical order. Experts from NCERT (RIE) train the key persons, the Key Persons train the Resource Persons and the Resource Persons train the Primary School Teachers. There is a lot of loss in this system. Therefore the following method may be adopted.

3. The persons who do not have any first hand experience of the Primary classes should not become the experts of this training at any level. Only those who have the first hand experience of primary classes can be taken as experts for the first level training.

4. These experts of RIEs should conduct the Training Programme for the Primary school teachers directly. The Resource Persons should be both participants and observers. During this programme the RPs should learn how to conduct such programme. Then these Resource Persons should conduct the next programme for Primary Teachers. So, there will be only two levels of training instead of three levels. The transmission loss is minimised. Moreover, the Resource Persons have seen the training programme (for Primary Teachers) and hence they can copy the same programme when they are conducting it.

5. It is suggested that the duration of the programme may be increased slightly and the timing can be from 10 am to 5 pm instead of 9 am to 5 pm. (The teachers find it difficult to reach the centre by 9 am from their villages.

6. The teachers will find it useful only if all the lectures are deleted and the activities are increased (as done in the Nanjanagud camp).

7. The Science Kit, Maths Kit the Tool kit and the other learning materials should be made available to all the schools/participants by the DSCERT/State Government during the Teacher Training camp under SOPT.

8. It will be very difficult for only four persons to conduct a camp. The course director will require the help of some more subject experts (in art education, SUPW, health education, etc.). Hence some provision may be made to bring one or two guest lecturers.

9. The DA given to the teachers may be increased (at present Rs.30/- for out station participants and Rs.10/- for locals).

10. It is impossible to provide Coffee/Tea twice a day from a budget of Rs.3/- per head per day. This may be increased to provide some eatables also. The budget for stationery items (books/pens, etc.) is also very less (Rs.200/- for 50 participants).

11. The local resource person gets Rs.35/- per day as honorarium. It is impossible to get a resource person for this amount.

12. If any camp is to be video graphed (as done at Nanjanagud), then such responsibility may be put on a separate team. This responsibility should not be put on the course director.

13. The total expenditure for this camp was Rs.15,533.10. This included the TA/DA of resource persons and the participants.

14. The success of the training camp will depend on the course director and his team. Hence proper persons should be selected for these jobs and they should be given a little more liberty. They should be given the liberty to choose the team also.

15. All the resource persons, including the course director should be the content persons with sufficient background of Teaching Mathematics, Language, Science and Social Studies.

16. There should be some provision for the content enrichment/clearing the doubts of teachers, within the SOPT programme.

Training Manual :

The Training Manual for SOPT published by the NCERT in 1995 does not require any major change except that the training components may be emphasised in every subject. Instead of the three Tier Training as suggested in the manual, it may be modified as given in (Item (4) above.

Now we give the Time Table which is common for both the first level and the second level Training Programmes in the suggested Alternatives Model.

Training Programme for SOPT

Day	10.00	11.30	11.45	1.30	2.00	3.30	3.45	5.00
1	Inaguration, opening session. General discussion on MLL child centred, activity based learning.		Participants see all the items of Maths Kit. Learn how to use it in the class room.		Group work. Teachers write different activities to develop competencies in Mathematics.		Report of the group work in general session. Preparation for the actual class.	
2	Maths lesson by a participant in the school.	Discussion on the lesson. Review of the previous day's work.	Discussion on the skills (competencies) in the language. List with examples.		Group work. Teachers discuss and write to develop <u>Language skills</u> .		Report of the group work (on language) planning for the class.	
3	Language lesson by a participant in the school.	Discussion on the lesson - ways of improving it. Review of previous day's work.	RP and participants discuss about the competencies in EVS I		Group work. Teachers discuss and write activities to develop camp in social studies.		Report of the group work (EVS I). Planning for the class.	
4	EVS I lesson by a participant in the school.	Discussion on the lesson - ways of improving it. Review of previous day's work.	RP and participants discuss about the competencies in EVS II.		Group work. Teachers discuss and write activities to develop camp in EVS II.		Report of the group work (EVS II). Planning for the class.	
5	EVS II lesson by a participant in the school.	Discussion on the lesson - ways of improving it. Review of previous day's work.	Introduction to Health Education & Nature work/map reading/sketch maps/Directions.		Art Education - RP does the demonstration. Participants and children do it.		Physical Education Exercise/ Examples with children. (4.30 - 5.00).	
6	Maths lesson II by a participant in another concept.	Discussion on the maths lesson - ways of improving it.	Discuss on the Multigrade Teaching/Film show or Multi-grade Teaching/Art Education.		SUPW demonstration by the resource person. Development of the same items by both Teachers and Children. (2.00 - 5.00).			
7	Language Lesson II another skill.	Discussion on lesson-ways of improving it.	Content questions in all subjects.		Arrange exhibition of Art-Education/SUPW Materials.		Practice/Closing session. Group song/National song	

List of Participants

1	Smt. Kasturi Bai Lower Primary School CHATRA-II, Nanjanagud Tq.	16	Smt. K.Vanajakshi L.P.S, Ashokapuram Nanjanagud
2	Smt. Vijaya H.P.G.S, Hullahally Nanjanagud Tq.	17	Smt. N.S.Nagashree H.P.B.S, Hullahally
3	T.V.Sachidananda L.P.S, Alaganchipura	18	Smt. M.Sowbhagya H.P.S, Moodala Hundi
4	Smt. B.Pushpa H.P.S, Golor	19	Smt. N.Meera C.L.P.S, Moodana Halli
5	Smt. R.Mahadevi H.P.S, Nagarle	20	Smt. N.Praveen Kumari H.P.S, Devarasana Halli
6	Smt. K.Geetha H.P.S, Chunchanahally	21	Smt. Zubeda Begum Govt. Urdu L.P.S, Azad Nagar, Nanjanagud
7	Iqbal Ahmad Govt. Urdu H.P.B.S Kavalande	22	Smt. Gulsanam Govt. Urdu L.P.S D/Kavalande
8	Smt. Uma H.P.B.S, R.P Road Nanjanagud	23	Smt. Gayathri Akerimath G.L.P.S, Taradale Kudalapur, Nanjanagud Tq.
9	Smt. Sundaramma G.H.P.S, Horalavadi	24	Smt. Gangu Bai M Bhat L.P.S, Kattadipura
10	Smt. P.M.Rathnamma Govt. H.P.S, Hosahalli	25	Smt. R.V.Ambika L.P.S, Mullur
11	Smt. Dixit Tara Ramanna H.P.S, Mallahalli Halepur Post	26	Smt. S.Prema H.P.S, Haginavalu
12	T.N.Ganesh G.H.P.S, Thandavapura	27	Smt. Meenakshi H.P.S, Suttur
13	Smt. Jayanthi H.P.S, Ariyur	28	Smt. Puttamma H.P.S, Chinnadagudi Hundi
14	Smt. Susheela G.L.P.S, HEBYA	29	Smt. A.Vasanthamma H.P.S, Heggadahalli
15	Smt. Vijaya Bhat G.H.P.S, Konanur	30	Smt. A.Narasamma L.P.S, Alambur

31	Smt. N.P.Jayalakshmi L.P.S, Extn. R.P Road Nanjanagud	40	Smt. Girija L.P.S, Basavattige
32	Smt. S.Suma L.P.S, BILUGALI	41	Smt. Susheelamma G.L.P.S, Yelachagere Coogalure Post
33	Smt. N.Shantha L.P.S, Medarageri	42	Smt. M.Sulochana G.H.P.S, Devanur
34	Smt. K.S.Suma Mani G.L.P.S, Taragama Halli	43	N.Subrahmanya G.H.P.S, Kalak
35	Smt. Sudhamani L.P.S, Karalpura	44	K.Basavaraj G.H.P.S, Hediya
36	Sri. Prabhu L.H.P.S, Kanenur	45	B.M.Raju G.H.P.S, Hemmaragala
37	B.Nagaraja G.L.P.S, Gowdra Hundi Rampura Post	46	T.S.Shivananjappa G.H.P.S, Akala
38	Smt. H.R.Bhagyamma G.H.P.S, Sujathapuram	47	S.Suresha L.P.S, Makaanapura
39	Smt. K.S.Bharathi G.L.P.S, Kollahally	48	N.Suresha L.P.S, Biligere

All the above schools are situated in Nanjanagud Taluk,
Mysore District.

ಬು ದ್ಧಿ ವಂ ತ ಕಾ ಗೆ

ಜಟುವಟಕೆ :

- ಕಥೆಗೆ ಸಂಬಂಧಿಸಿದ ಜಿತ್ರಪಟ ತೋರಿಸುತ್ತಾ ಕಥೆ ಹೇಳುವುದು
- ಮಕ್ಕಳು ಜಿನಾಗಿ ಕೇಳಿಸಿಕೊಳ್ಳಬೇಕು
- ಸರಿಯಾಗಿ ಗ್ರಹಿಸುತ್ತಿದ್ದಾರೆಯೇ ಎಂದು ತಿಳಿದುಕೊಳ್ಳಲು ಅಲ್ಲಲ್ಲ ಪುಟ್ಟ ಪುಟ್ಟ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುವುದು
- ಕಾಗೆಯು ಧ್ವನಿ (ಕಾ ಕಾ)ಯನ್ನು ಅನುಕರಿಸಲು ತಿಳಿಸುವುದು
- ಇದೇ ಕಥೆಯಲ್ಲ ಬಳಸಿದ ಜಿತ್ರಪಟಗಳನ್ನು ಜೋರಿಸಲು ಹೇಳುವುದು
- ನರಿ ಕಾಗೆಯನ್ನು ಹೊಗಳಿದ ಮಾತುಗಳನ್ನು ಮಕ್ಕಳಿಂದ ಹೇಳಿಸುವುದು

ಮೂಲ್ಯವಾಪನ :

- (1) ಕಾಗೆ ಎಲ್ಲ ಕೂತಿದೆ?
- (2) ಕಾಗೆ ಏನನ್ನು ಕಷ್ಟಕೊಂಡು ಬಂದಿತ್ತು?
- (3) ನರಿಯ ಬಾಯಿಯಲ್ಲ ನೀರು ಏಕೆ ಬಂದಿತ್ತು?
- (4) ಮಾಂಸದ ಜಾರನ್ನು ಪಡೆಯಲು ನರಿ ಏನು ಉಪಾಯ ಮಾಡಿತು?
- (5) ನರಿಯು ಕಾಗೆಯ ಯಾವ ಯಾವ ಭಾಗಗಳನ್ನು ಹೊಗಳಿತು?
- (6) ಕಾಗೆ ಹಾಡುವಾಗ ಮಾಂಸದ ಜಾರನ್ನು ತನ್ನ ಕಾಲಿಗೆ ಏಕೆ ಸಿಕ್ಕಿಸಿಕೊಂಡಿತ್ತು?
- (7) ನರಿಯು ಏಕೆ ಪೆಟ್ಟುಮುಖ ಹಾಕಿಕೊಂಡು ಹೊರಟುಹೋಯಿತು?
- (8) ಇದು ಎಲ್ಲ ಕಾಗೆ?
- (9) ಈ ಕಥೆಯಲ್ಲ ಯಾರು ಬುದ್ಧಿವಂತರು?
- (10) ಈ ಕಥೆಯ ನೀತಿಯೇನು?

ಮಾರಕ ಜಟುವಟಕೆ :

- ಧ್ವನಿಸುರುಳಿಯನ್ನು ಬಳಸಿ, ಪ್ರಾಣಿ ಪಕ್ಷಿಗಳ ಧ್ವನಿಯನ್ನು ಗುರುತಿಸುವಂತೆ ತಿಳಿಸುವುದು

ಪಾಠೋಪಕರಣಗಳು :

ಜಿತ್ರಪಟ, ಪ್ರಾಣಿ ಪಕ್ಷಿಗಳ ಕೂಗಿನ ಧ್ವನಿಮುದ್ರಣ, ಬೇಪರಿಕಾರ್ಡ್.

ಪ್ರಾದೇಶಿಕ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆ, ಮೈಸೂರು- 6

ಪ್ರಾಥಮಿಕ ಶಿಕ್ಷಕರ ಪುನಶ್ಚೇತನ ತರಬೇತಿ ಶಿಬಿರ 2-9-95 - 18-9-95

ಗುರುಭವನ, ನಂಜನಗೂಡು, ಮೈಸೂರು ಜಿಲ್ಲೆ

ಶಿಬಿರಾರ್ಥಿಗಳ ಅಭ್ಯಾಸ ಸಂಗ್ರಹಣೆ

ಈ ಕೆಳಗೆ ತಿಳಿಸಿದ ವಿಷಯಗಳ ಮೇಲಿನ ನಿಮ್ಮ ಅಭಿಪ್ರಾಯವನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ಸೂಚಿಸಿರಿ.

ವಿಷಯ

ಉಪಯುಕ್ತವಾಗಿತ್ತೆ ?
ಹೌದು : ಅಲ್ಲ

ಕಾರಣ

- 1 ಕಲಿಕೆಯ ಕನಿಷ್ಠ ಹಂತಗಳು
- 2 ಶಿಬಿರ ಕೇಂದ್ರಿತ ಸಾಮರ್ಥ್ಯ
ಅಧಾರಿತ ಬೋಧನಾ ಕ್ರಮ
- 3 ವ್ಯಾಪಕ (ಸಮಗ್ರ) ಹಾಗೂ
ನಿರಂತರ ಮೌಲ್ಯ ಮಾಪನ
- 4 ಕಲಾ ಶಿಕ್ಷಣ
- 5 ಆರೋಗ್ಯ ಹಾಗೂ ದೈಹಿಕ ಶಿಕ್ಷಣ
- 6 ಕಾರ್ಯಾನುಭವ
- 7 ಬಹು ವರ್ಗ ಬೋಧನೆ
- 8 ಭಾಷೆ (ಕನ್ನಡ)
- 9 ಗಣಿತ
- 10 ಪರಿಸರ ಅಧ್ಯಯನ I (ಸಮಾಜ)
- 11 ಪರಿಸರ ಅಧ್ಯಯನ II (ವಿಜ್ಞಾನ)
- 12 ಶಿಬಿರದಲ್ಲ ತೋರಿಸಿದ ಇತರ ಸಾಮಗ್ರಿಗಳ
ಗಣಿತದ ಕಿಟ್, ವಿಜ್ಞಾನದ ಕಿಟ್, ವಿವಿಧವಾದ
ಕಿಟ್, ಮುದ್ರಿಸಿದ ಸಾಮಗ್ರಿಗಳು ಇತ್ಯಾದಿ
- 13 ಪ್ರದರ್ಶಿಸಿದ ವೀಡಿಯೋ ಫಿಲ್ಮ್‌ಗಳು :
 - 1 ಲುಕ್ಸಿಂಗ್ ಎಚ್ ಲರ್ನಿಂಗ್ I
 - 2 ಲುಕ್ಸಿಂಗ್ ಎಚ್ ಲರ್ನಿಂಗ್ II
 - 3 ಆರ್ಟ್ ಎಜುಕೇಶನ್
- 14 ಭೌತಿಕ ಸೌಕರ್ಯಗಳು ಸರಿಯಾಗಿತ್ತೇ ? ಉತ್ತರ : ತೃಪ್ತಿಕರ : ಸಮಸ್ಯೆ
 - 1 ಆಸನ ವ್ಯವಸ್ಥೆ
 - 2 ವೀಡಿಯೋಪರಣ
 - 3 ಗುಂಪು ಚಟುವಟಿಕೆಗಳಿಗೆ ಇದ್ದ ಸೌಕರ್ಯ
 - 4 ಕಾರ್ಯಾನುಭವಕ್ಕೆ : ಕಲಾ ಶಿಕ್ಷಣಕ್ಕೆ ಇದ್ದ
ಸೌಕರ್ಯ

15 ಕಾಲಾವಧಿ

ಶಿಬಿರದ ಅವಧಿ _____ ದಿನಗಳಿದ್ದರೆ ಉತ್ತಮ

ದಿನದ ಕಾರ್ಯಕ್ರಮ _____ ರಿಂದ ಸಂಜೆ _____ ಗಂಟೆಯವರೆಗೆ

ಇದ್ದರೆ ಉತ್ತಮ, ಪ್ರತಿ ಹೀರಿಯುಡನ ಅವಧಿ _____ ಗಂಟೆ ಇದ್ದರೆ

ಉತ್ತಮ, ಭೋಜನ ವಿರಾಮ _____ ಗಂಟೆ ಇದ್ದರೆ ಉತ್ತಮ

16 ಶಿಬಿರದ ಬಗ್ಗೆ ನಿಮಗೆ ಅನಿಸಿದ ಕೆಲವು ಉತ್ತಮ ಅಂಶಗಳು

17 ಶಿಬಿರವನ್ನು ಇನ್ನೂ ಹೆಚ್ಚು ಉಪಯುಕ್ತಗೊಳಿಸಲು ನಿಮ್ಮ ಸಲಹೆಗಳು

18 ನೀವು ಈ ರೀತಿಯ ಯಾವುದಾದರೂ ಶಿಬಿರದಲ್ಲಿ ಭಾಗವಹಿಸಿದ್ದೀರಿ ?
ಯಾವಾಗ ?

ಎಷ್ಟು ದಿನಗಳದ್ದು ?

ಯಾರು ಸಂಯೋಜಿಸಿದ್ದು ?

19 ಜೋರಣೆಯಲ್ಲಿ ನಿಮ್ಮ ಸರ್ವಿಸ್ _____ ವರ್ಷಗಳು

20 ಕಲಿಕೆಯ ಕನಿಷ್ಠ ಹಂತಗಳನ್ನು ಅಳವಡಿಸಿಕೊಳ್ಳಲು ನಿಮಗೆ ಏನಾದರೂ
ಸಮಸ್ಯೆಗಳಿವೆಯೇ ?

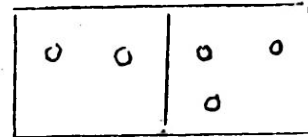
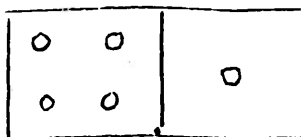
ಪ್ರಾಥಮಿಕ ಹಂತದಲ್ಲಿ ಗಣಿತದ ಬೋಧನೆಯನ್ನು ಸಾಧ್ಯವಾದಷ್ಟು ಮಟ್ಟಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮೂಲಕವೇ ಮಾಡಬೇಕೆನ್ನುವುದು. ಎಲ್ಲರಿಗೂ ತಿಳಿದ ವಿಚಾರ. ಆದರೂ ಕೂಡ ಕೆಲವು ಪ್ರಾಥಮಿಕ ಶಾಲೆಗಳಲ್ಲಿ ಗಣಿತವನ್ನು ಯಾಂತ್ರಿಕವಾಗಿಯೇ ಇನ್ನೂ ಕಲಿಸುತ್ತಿದ್ದಾರೆ. ಇದರಿಂದಾಗಿ ಮಕ್ಕಳ ಮನಸ್ಸಿನಲ್ಲಿ ಗಣಿತದ ಬಗ್ಗೆ ಒಲವು ಮಾಡುತ್ತಿಲ್ಲ, ಹಾಗೂ ಗಣಿತವನ್ನು ನಿರ್ಧಾನವಾಗಿ ದ್ವೇಷಿಸಲು ಪ್ರಯತ್ನಿಸುತ್ತಾರೆ. ಇಂತಹ ದುಷ್ಪರಿಣಾಮಗಳನ್ನು ಹೋಗಲಾಡಿಸಲು ನಾವು ಸಾಧ್ಯವಾದಷ್ಟು ಮಟ್ಟಿಗೆ ಪಾಠಗಳನ್ನು ಆಟಗಳ ರೂಪದಲ್ಲಿ ಕೊಂಡೊಯ್ಯಬೇಕು. ಎಂತಹ ಆಟಗಳನ್ನು ಯಾವ ಸಂದರ್ಭಗಳಲ್ಲಿ ಆಡಿಸಬಹುದೆಂಬ ಕಲ್ಪನೆ ಹಲವು ಉಪಾಧ್ಯಾಯರುಗಳಲ್ಲಿ ಇರುವುದಿಲ್ಲ. ಆದರೂ ಅಲ್ಲದೆ ಈ ರೀತಿಯ ಚಟುವಟಿಕೆಗಳನ್ನು ಮಾತ್ರ ಮಾಡಿಸುತ್ತಾ ಬಂದರೆ ನಾವು ಗಣಿತವನ್ನು ಬೋಧಿಸಲು ಇನ್ನುಳಿದ ಸಮಯವು ಸಾಕಾಗಲಾರದು ಎಂಬ ಭಾವನೆಯು ಹಲವು ಉಪಾಧ್ಯಾಯರುಗಳ ಮನಸ್ಸಿನಲ್ಲಿ ಇರುತ್ತದೆ. ನಿಜ ಸ್ಥಿತಿಯು ಮಾತ್ರ ಹಾಗಲ್ಲ.

ಪ್ರಾಥಮಿಕ ಶಿಕ್ಷಣದ ಗುಣ- ಮಟ್ಟವನ್ನು ಉತ್ತಮ ಪಡಿಸಲು ಸರಕಾರವು ಹಾಕಿ ಕೊಂಡ ಕಪ್ಪು ಹಲಗೆ ಕಾರ್ಯಾಚರಣೆ ಕಾರ್ಯಕ್ರಮದ ಅಂಗವಾಗಿ ಗಣಿತದ ಪೆಟ್ಟಿಗೆ (ಗಣಿತದ ಕಿಟ) ಗಳನ್ನು ಎಲ್ಲಾ ಶಾಲೆಗಳಿಗೂ ಹಂಚಲಾಗಿದೆ. ಈ ಕಿಟಗಳನ್ನು ಉಪಯೋಗಿಸಿಕೊಂಡು, ಮತ್ತು ಈ ಕಿಟಗಳು ಇಲ್ಲದಾಗ ಸ್ಥಳೀಯವಾಗಿ ಸಿಗುವ ಇತರ ಯಾವುದೇ ವಸ್ತುಗಳನ್ನು ಉಪಯೋಗಿಸಿ ಪ್ರಾಥಮಿಕ ಹಂತದಲ್ಲಿ ಏನೇನು ಚಟುವಟಿಕೆಗಳನ್ನು ನಡೆಸಬಹುದೆಂದು ತಿಳಿಸಲು ಈ ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಪ್ರಯತ್ನಿಸಲಾಗುವುದು. ಗಣಿತದ ಕಿಟನಲ್ಲಿರುವ ಎಲ್ಲಾ ವಸ್ತುಗಳನ್ನು ಉಪಾಧ್ಯಾಯರುಗಳಿಗೆ ಪರಿಚಯ ಮಾಡಿಸಿಕೊಡುವುದೇ ಇಲ್ಲಿಯ ಮುಖ್ಯ ಉದ್ದೇಶ.

ಈ ಕಿಟನಲ್ಲಿ ಒಟ್ಟು ಏಳು ರೀತಿಯ ಕಲಿಕೆಯ ಸಾಧನಗಳ ಮಾದರಿಗಳಿವೆ :

- 1 ರಂಧ್ರ ಪಟ್ಟಿಗಳು (ಡೋಮಿನೋಸ್ DOMINOES)
- 2 ಅಳತೆ ಪಟ್ಟಿಗಳು (ಖುಸೇನರ್ ಸ್ಟ್ರಿಪ್ಸ್ CUSENAIRE STRIPS)
- 3 ಅಯುತ ಘನಕಾರದ ಕಡ್ಡಿಗಳು (ಕ್ಯೂಬಿಕ್ ರಾಡ್ಸ್ CUBIC RODS)
- 4 ಗುಣಕಾರದ ಪಟ್ಟಿಗಳು (ನೇಪಿಯರ್ ಸ್ಟ್ರಿಪ್ಸ್ NAPIER STRIPS)
- 5 ಮಣಿಕಟ್ಟು (ಸ್ಪೈಕ್ ಎಬಾಕಸ್ SPIKE ABACUS)
- 6 ಭನ್ನರಾಶಿಯ ವರ್ತುಲಗಳು (ಫ್ರೇಕ್ಷನ್ ಡಿಸ್ಕ್ FRACTION DISC)
- 7 ವಿವಿಧ ಘನಾಕೃತಿಗಳು (ಸಾಲ್ಡ್ಸ್ SOLIDS)

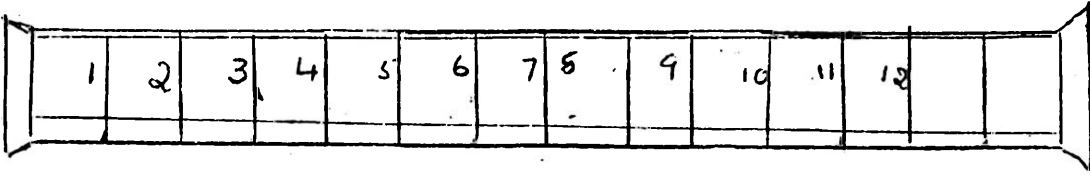
- 1 ರಂಧ್ರ ಪಟ್ಟಿಗಳು :



ಗಣಿತದ ಪಟ್ಟಿಗೊಂಟಾಳಗೆ ಈ ಚಿತ್ರದಲ್ಲಿ ತೋರಿಸಿದ ರೀತಿಯು 55 ರಟ್ಟಿನ ಪಟ್ಟಿಗಳಿವೆ. ಪ್ರತಿ ಪಟ್ಟಿಯು ಮಧ್ಯದಲ್ಲಿ ಒಂದು ನೀ.ಬಿ.ಗೊಂಟಾಳ ಇದೆ. ಗೊಂಟಾಳ ಎರಡೂ ಭಾಗಗಳಲ್ಲಿ ಕೆಲವು ರಂಧ್ರಗಳಿವೆ. 0 ಯಿಂದ 9 ರ ವರೆಗಿನ ಎಲ್ಲಾ ರಂಧ್ರಗಳಿರುವ ಪಟ್ಟಿಗಳೂ ಇವೆ. ಈ ರಂಧ್ರ ಪಟ್ಟಿಗಳನ್ನು ಉಪಯೋಗಿಸಿ, ಸಂಖ್ಯೆಗಳ ಎಣಿಕೆ, ಹೆಚ್ಚು ಕಡಿಮೆಯು ಕಲ್ಪನೆ, ಕೂಡುವುದು, ಕಳೆಯುವುದು ಇತ್ಯಾದಿ ಹಲವು ಗಣಿತ ಕ್ರಿಯೆಗಳನ್ನು ನಾವು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ತಿಳಿಸಬಹುದು.

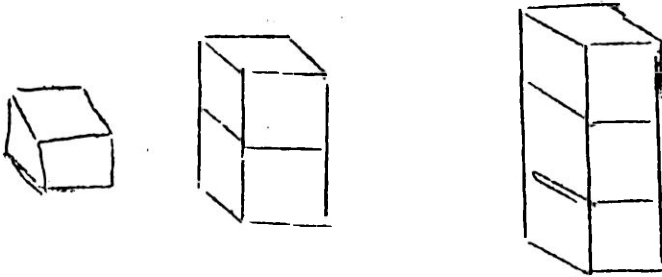
2 ಅಳತೆ ಪಟ್ಟಿಗಳು :

1 ರಿಂದ 10ರ ವರೆಗಿನ ಉದ್ದಗಳನ್ನು 10 ತುಂಡು ಪಟ್ಟಿಗಳೂ, 20 ಉದ್ದವು ಇನ್ನೊಂದು ಪಟ್ಟಿಗೊಂಟಾಳ ಪಟ್ಟಿಯೂ ಇದೆ. ಈ ಪಟ್ಟಿಗೊಂಟಾಳ ಎರಡೂ ಬದಿಗಳಲ್ಲಿ ತುಂಡು ಪಟ್ಟಿಗಳನ್ನು ಜೋಡಿಸಲು ಸ್ಥಳವೂ ಇದೆ.



ಅಂಕಗಳನ್ನು ಓದುವ, ಗುರುತಿಸುವ, ಕೂಡಿಸುವ, ಕಳೆಯುವ, ಅಭ್ಯಾಸಗಳನ್ನು ಈ ಪಟ್ಟಿಗಳ ಸಹಾಯದಿಂದ ಮಾಡಬಹುದು. ಅಂಕಗಳ ಖರೀದಿ (ಆರೋಹಣ) ಹಾಗೂ ಇಳಿಯುವ (ಅವರೋಹಣ) ಅಭ್ಯಾಸವನ್ನೂ ಮಾಡಿಸಬಹುದು.

3 ಆಯತ ಘನಕಾರದ ಕಡ್ಡಿಗಳು :



ಒಂದರಿಂದ ಹತ್ತಿರವರೆಗಿನ ಎಲ್ಲಾ ಮಾನದ ಕಡ್ಡಿಗಳಿವೆ. ಪ್ರತಿಯೊಂದು ಅಳತೆಯ ಹತ್ತು ಕಡ್ಡಿಗಳ ಕಟ್ಟುಗಳೂ ಇವೆ. ಸ್ಥಾನಜಿಲೆಯು ಸೂಚನೆ, ಗುಣಕಾರ, ಭಾಗಕಾರ, ವಿಸ್ತೀರ್ಣ, ಘನ ಫಲ ಇತ್ಯಾದಿ ಹಲವು ಕಲ್ಪನೆಗಳನ್ನು ಮೂಡಿಸಬಹುದು.

4 ಗುಣಕಾರದ ಪಟ್ಟಿಗಳು :

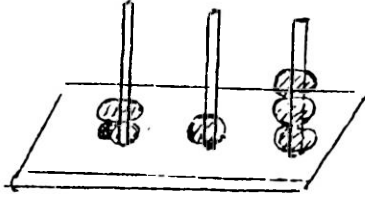
35 ನೆ.ಮೀ ರ 3.5 ನೆ ಮೀ ಗಾತ್ರದ ಹತ್ತು ಆಯತಕಾರದ ಪಟ್ಟಿಗಳನ್ನು ಪಟ್ಟಿಗೊಂಟಾಳಗೆ ಜೋಡಿಸಲಾಗಿದೆ. ಇವುಗಳಲ್ಲಿ ಒಂಭತ್ತು ಪಟ್ಟಿಗಳು ಬಳಿ ಬಣ್ಣದವು. ಒಂದು ಪಟ್ಟಿಯು ಹಸಿರು ಬಣ್ಣದ್ದಾಗಿರುತ್ತದೆ.

2/4	6
2/0	5
1/6	4
1/8	3
1/8	2
1/4	1

: 3 :

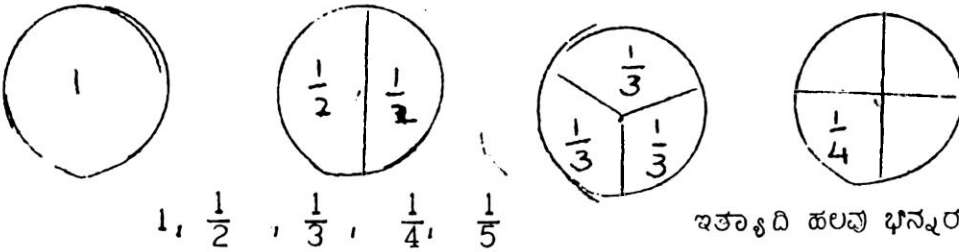
ಹಸಿರು ಬಣ್ಣದ ಪಟ್ಟಿಯನ್ನು ಎಡಕ್ಕಾಗಿ ಇನ್ನು ಯಾವುದೇ ಬಣ್ಣದ ಪಟ್ಟಿಯನ್ನು ಅದರ ಬಲಕ್ಕಾಗಿ ಜೋಡಿಸಿ ನೇರವಾಗಿ ಹಿಡಿದಲ್ಲಿ ಗುಣಕಾರದ ಪಟ್ಟಿಯು ಸಿದ್ಧವಾಗುತ್ತದೆ. ಇದನ್ನು ಉಪಯೋಗಿಸಿ ಗುಣಕಾರವನ್ನು ಪರಾಮರ್ಶಿಸಬಹುದು. ಎರಡು ಅಥವಾ ಮೂರು ಅಂಕಗಳ ಸಂಖ್ಯೆಯ ಮುಖವನ್ನು ಬರೆಯಬಹುದು. ಕೆಳಗಿನ ತರಗತಿಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಇದು ಸ್ವಲ್ಪ ಕಷ್ಟಕರವೆಂದು ಕಂಡು ಬಂದಲ್ಲಿ ಗುಣಕಾರದ ಪಟ್ಟಿಗಳನ್ನು ಕೆಳ ತರಗತಿಗಳಲ್ಲಿ ಉಪಯೋಗಿಸಬಹುದು ಎಂದು ಇರಬಹುದು.

5 ಮುಣಕಟ್ಟು (ಎಬಾಕಸ್) : ಹಲವು ವರ್ಷಗಳಿಂದಲೂ ಮುಣಕಟ್ಟು ಗಣಿತದ ಅಭ್ಯಾಸದಲ್ಲಿ ಪ್ರಚಾರದಲ್ಲಿ.



ಮುಣಕಟ್ಟಿನ ಪ್ರತಿಯೊಂದು ಸ್ತಂಭದಲ್ಲಿಯೂ 9 ಮುಣಗಳು ಮಾತ್ರ ನಿಲ್ಲುವಂತಿರಬೇಕು. ಮುಣಕಟ್ಟಿನ ಒಂದು ಭಾಗದಲ್ಲಿ ಸಾಧನ ಬೆಲೆಯನ್ನು ಸೂಚಿಸುವ ಪಟ್ಟಿಯನ್ನು ಅಂಟಿಸಬೇಕು. ಬೇರೆ ಬೇರೆ ಸಾಧನಗಳನ್ನು ಗುರುತಿಸಲು ಬೇರೆ ಬೇರೆ ಬಣ್ಣದ ಮುಣಗಳಿದ್ದರೆ ಉತ್ತಮ. ಸಾಧನಬೆಲೆ, ಕೂಡಿಸುವುದು ಮತ್ತು ಕಳೆಯುವುದನ್ನು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಮುಣಕಟ್ಟಿನ ಮೂಲಕ ಅಭ್ಯಾಸ ಮಾಡಿಸಬಹುದು.

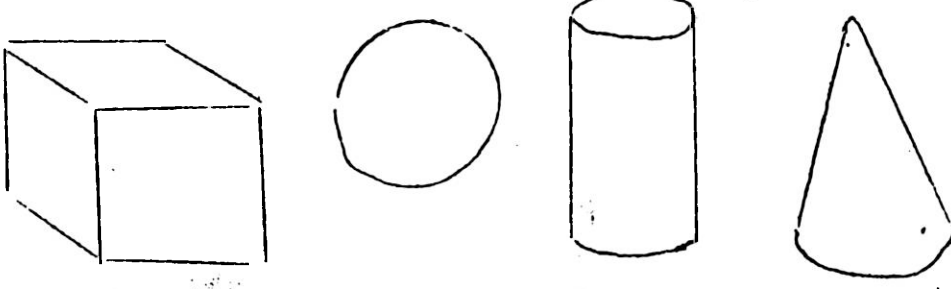
6. ಭಿನ್ನ ರಾಶಿಯ ವರ್ತುಲಗಳು :



ಇತ್ಯಾದಿ ಹಲವು ಭಿನ್ನರಾಶಿಗಳನ್ನು

ತೋರಿಸುವ ಪಟ್ಟಿಯ ಅಂಶಗಳನ್ನು ಇದರಲ್ಲಿ ಕೂಡಲಾಗಿದೆ. ಭಿನ್ನರಾಶಿಗಳಲ್ಲಿ ಯಾವುದು ದೊಡ್ಡದು ಯಾವುದು ಚಿಕ್ಕದು ಎಂದು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಹೋಲಿಸಿ ನೋಡಬಹುದು. ಭಿನ್ನರಾಶಿಯ ಕಲ್ಪನೆ ಮೂಡಿಸಬಹುದು. ಫಲದಗಳು ಸಮಾನವಾಗಿರದಾಗ ಭಿನ್ನರಾಶಿಗಳನ್ನು ಕೂಡಿಸುವ ವಿಧಾನವನ್ನು ತಿಳಿಸಬಹುದು. ಇದೇ ರೀತಿಯಲ್ಲಿ ಇನ್ನೂ ಹಲವು ಚಟುವಟಿಕೆಗಳನ್ನು ನಡೆಸಬಹುದು.

7 ಘನಾಕೃತಿಗಳು :



ಚೌಕ, ಘನ, ಆಯತ ಘನ, ಗೋಲಾಕಾರ, ಸ್ತಂಭಾಕಾರ, ಶಂಕು ಆಕಾರ
ಇತ್ಯಾದಿ ಐದು ರೀತಿಯ ಘನಾಕಾರದ ಮರದ ತುಂಡುಗಳನ್ನು ಕೊಡಲಾಗಿದೆ. ಒಂದನೇ
ತರಗತಿಯಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಯು ಇವುಗಳ ಆಕಾರಗಳನ್ನು ಗುರುತಿಸಬೇಕು. ಎರಡನೇ
ತರಗತಿಯವರು ಅವುಗಳನ್ನು ಹೆಸರಿಸಬೇಕು. ಮೇಲಿನ ತರಗತಿಗಳಿಗೆ ಹೋದಂತೆ ಅಂತಹ
ಆಕಾರಗಳನ್ನು ವಿದ್ಯಾರ್ಥಿಯು ತಯಾರಿಸುವುದಲ್ಲದೆ ಅವುಗಳ ಮೇಲ್ಮೈ ವಿಸ್ತೀರ್ಣ,
ಘನಫಲಗಳನ್ನು ಕಂಡು ಹಿಡಿಯಲು ಸಾಧ್ಯವಾಗಬೇಕು

ಈ ಮೇಲಿನ ವಿವಿಧ ವಸ್ತುಗಳನ್ನು ಗಣಿತದ ಕೆಲಸಕ್ಕೆ ನೋಡಿ, ಯಾವ ಯಾವ
ಸಾಮರ್ಥ್ಯಗಳನ್ನು ಯಾವುದರ ಸಹಾಯದಿಂದ ಬಳಸಬಹುದೆಂಬುದನ್ನು ಕಾರ್ಯಾಗಾರದಲ್ಲಿ
ವಿಷಯ ತಜ್ಞರೊಂದಿಗೆ ಚರ್ಚಿಸಿ ತಿಳಿದುಕೊಳ್ಳಿರಿ.