

Acting hands, making minds-1

A first meeting with Anil Emage and Laila of AFRC, initiated by Corrine Karlaganis of Uravu Eco Links took shape into a workshop after 3months!

This was a workshop conducted in a small village at Wayanad district, Kerala. AFRC and URAVU organised the event. It was a unique experience. For the 'First time' I had no support of my students while conducting the workshop. All the preparations had to be done before hand in Mumbai.

URAVU provided all the infrastructure and support of volunteers.

Thanks to Anil and Laila it got publicity in Mathrubhumi and Deccan Herald.

The only problem was in the videos

A G Rao became A N Rao

I have uploaded the Videos.

<https://youtu.be/NlSGnX7-AXw>

<https://youtu.be/d3MQFxuuv0I>

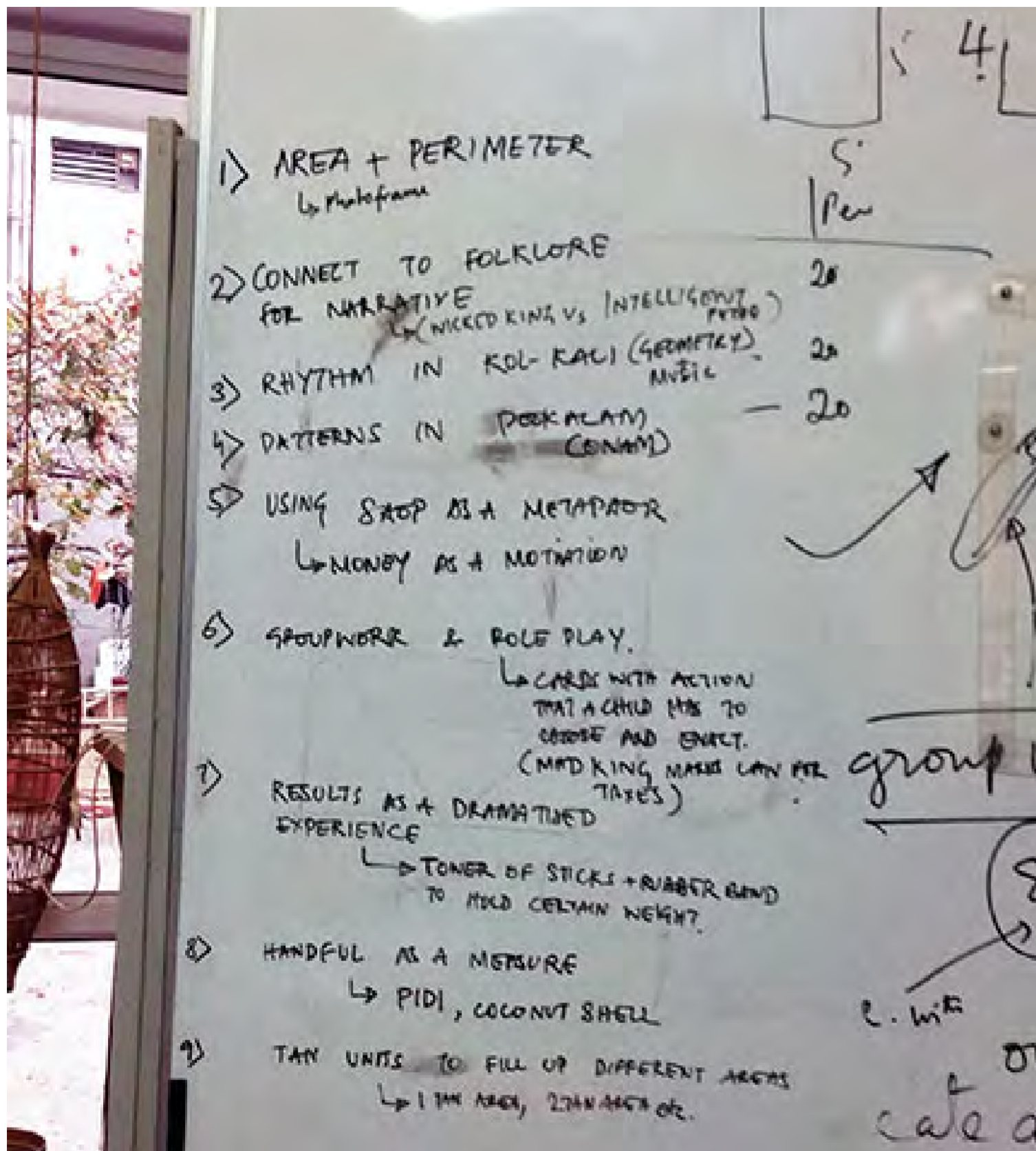
Hey you!

There's a workshop!

By Prof A G Rao (IIT Mumbai)

Duration: 16th April to 20th April
Time: 10 am to 4pm
All 12-13 year olds invited!
Registration: Rs 500/-
(Tea & snacks and lunch inclusive)
Venue: Uravu Bamboo Village
Media in charge: Laila Saein:
9747117197
For registration: 9656232651

Craft! Creativity! Language! Maths! Science!



Initial Preparations

The workshop was a wonderful opportunity for designers: 'How can we think with a fresh mind? Can we bring a cultural context? Sivaraj, from Uravu, had come to Mumbai for some other work! I took the opportunity. 'Brain storming with an 'open mind' can be very educative!

An invitation was sent:

A 'Brain Storming session on the theme and workshop' is planned at Bambu Studio, IDC tomorrow on 5th April 2014. Mr. Sivaraj from Uravu will be present. few IDC students, Couple of IDC alumni, few phd students are expected to join us! You are invited to come and participate!

About 8 persons gathered.

There were many questions as some not familiar with our other workshops. As can be seen on the white board many themes and ideas came up, which are listed separately.

Brain storming helped to warmup our thinking, but could not culminate into new usable ideas!

As designers we always dream, fantasise many ideas but only few(or none) will materialise! But this process is important, as this keeps you creative! It will manifest in some apparently unconnected place, may be when you are solving another problem in totally different zone

1. AREA +PERIMETER- Make frames
- 2.CONNECT TO FOLKLORE- Wicked king versus intelligent Hero
- 3.Rhythm in KOL KALI- (Geometric) -Mystic
- 4.PATTERNS IN POKALAM (ONAM)
- 5.USING SHOP AS A METAPHOR
- MONEY AS MOTIVATION
- 6.GROUP WORK AND ROLE PLAY
-CARDS WITH ACTION-THAT A CHILD HAS TO CHOOSE AND EN-ACT
7. RESULTS AS A DRAMATISED EXPERIENCE
- TOWER OF STICKS +RUBBER BANDS TO HOLD COLUMN WEIGHT
- 8.HANDFUL AS A MEASURE- pidi, COCONUT SHELL
- 9.TAN UNITS TO FILLUP DIFFERENTAREAS-1 TAN AREA ,2 TAN AREA ETC.

I try to plan as much in detail as possible and be flexible while executing it. This was first time I was doing in another town with no knowledge of physical facilities. This turned out to be good experience. Anil and Laila took care of the announcement. I was happy to see a lively design done by Kokila. It brought the spirit of workshop well. Workshops of this kind need lot of prior preparation. It is difficult for people without design background to appreciate this. Each detail, like colour and type of paper or cardboard to be used, matters. I assumed material procurements may have a problem in Kalpetta. So I sent a detail list of materials to be procured as well as what is envisaged to happen in the work shop well in advance. I thought I have done a great job in visualising and writing out in detail.

But it did not have the intended effect.

It was a great learning experience for me. I had assumed efforts would have been put and things would be ready by the time I reached. Systematic organisational skills, commitment and communication were lacking. I also realized a big gap in 'Perception' of details in preparation.

Nikhil, one of my TAs, who hails from from Trikaipetta was to accompany me for the workshop. Though he helped in all the preparations including preparing drawings for floating pencil, packng Tangrams,etc, he had to cancel his trip in the last day!

Materials to be procured(sent in advance)

Children can bring their pens and pencils...

Sl. No.	Item	Qty	Comments
1	A4 Sheet	1 ream (500 sheets)	for Regular activities by students
2	A3 Sheet(420x297)	30 sheets	Drawing
3	ColoColour Pen	10 sets	2 per group
4	Apsara pencil	3 sets (36 nos.)	For magnetic levitation
5	12” long Steel Ruler	6 nos.	Measurements
6	Glue Stick	10 nos.	
7	Fevicol – small tubes	6 nos.	
8	Scissor	6 nos.	
9	Rubber bands	2 boxes	
10	Paper cutters	6 nos.	
11	Stapler	2 nos.	
12	Cello tape –small	6 nos.	
13	Twine thread bundle	1 bundle	for hanging sheets etc
14	Thermocole – 2cm thick	3 sheets	
15	Thick card board / Mount board – imperial size	6 nos.	
	Mount board for puppets		
16	Fine Sand paper	6 nos.	

A detailed write up for 3day activities was prepared and sent as can be seen in the next pages.

Wayanad Workshop

Day1

First session will be Creative Introductions. Groups of two will be made .Each student talks to other to know other's nick name, pranks he/she played, hobbies, special interests etc. Then each will introduce other in English/ Malayalam. Language speaking practice takes place. I will be asking what each one likes 'a bird, animal/reptile/ insect and a flower.' Each will make the sound of the animal/.....

First day's focus is in Art Creativity. They will be given a sheet with circles . They have to make each circle as., and make the circle that object or living thing. An example is a face out of circle. This is a metaphoric exercise to see circle as. They can come up with a clock, wheel,..... They will draw making each circle something! Each will be given a sheet with 15circles. If anybody finishes fast, one more sheet can be given. Time:Half to one hour.

The second activity for the day will be making a bird/animal/insect out of leaves dry or green, flowers or fruits. They will be shown such compositions done earlier in a Teacher's workshop (with I- pad or LCD projector). They have to make their own figures from their imagination. Nothing will be drawn. Images have to be built out of leaves,...

They will go out collect all kinds of leaves figs etc, in later part of morning(for an hour)
Seeing Nature with creative eye will be the task.

Lunch

Post lunch they will make their figure compositions on a thick A3 (420x297) sheet. Once they are satisfied, they will stick the leaf etc on to the sheet. End of the day they will display their sheets which can be fixed on wall with tape or hung on a thread. They can pin them if there is soft board.

They will be briefed for the next day 'to think of a character', for making a puppet in Bamboo and card board which can be coloured. Sample Puppet can be shown.

Day2

Children will be shown a puppet and puppet video(short) on projector or I-pad. Each will be given a grid sheet. They will draw the puppet with the character they have thought! It can be any fictional character! Baffoon, magician, Local characters!

Lengths of hands and legs are fixed which will be made in bamboo.

I am bringing rivets to join. The card board of body, head .hands. legs can be coloured by them.

The card board body proportions can change to suit their character.

After drawing is done (one hour) they will go to workshop. An introduction to Bamboo will be given.

Tools will be explained with a demo. Demo of how to make strips of 2mm thick, 10mm width with different lengths will be done and how to join them with rivets will be shown. They will make strips of required size for their puppets in the morning.

Lunch

Card board will be cut for each puppet. They can work in groups of two. Bamboo hands and legs will be attached with rivets to the card board. All joints have to move.(I am bringing rivets).

Then they will colour the puppet and Fix a stick to make it dance. By the end of the day they finish and display the puppets.

Day3

Children will be introduced to Tangram. A small film can be shown with LCD projector!

Each person will get a Tangram set. They will feel the pieces. Identify geometric shapes. Right angle triangles, Square and parallelogram. See the beauty of dimensional relationships.

A sheet of tan cats and tan animals will be given to them. Each of Tan figures are always made using all the pieces in different arrangements. They will make the figures with their tangram seeing small scale figures. Each will make 3 to 4 figures. Whatever they make, they will transfer on to a sheet using the template. When they transfer a figure made with physical pieces on to a paper, they will be learning visual dexterity and visualizing the geometric figures. They also learn to transfer these images in their minds. They will be playing with physical pieces to augment their visualisations. Their Cognitive abilities in shape perception are developed in the process. They will display the figures they made and drawn.

Each group will make a narrative using their animal figures as characters.

In the next session they will learn Maths with Tans. They will make squares with 2,3,4,5 and 7 pieces.

They will make letter E in two ways, each time using all the pieces.

They will learn small and big fractions using Tans. Tangram has tans with $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ of the full square. They can see how $\frac{1}{8} + \frac{1}{8}$ can become $\frac{1}{4}$. By placing two small triangles on a bigger Triangle / square / parallelogram. Fractions in area gets concretized in their learning.

Lunch

After lunch children will make 'same perimeter linkages' with different dimensions.

Following dimensions will be given to each group.

12x12x8x4, 12x12x6x6, 12x12x7x5, 12x12x10x2.

All the linkages have same perimeter.

They will be making different figures like square, two rectangles, triangle with their linkage.

They will discover by measuring area on a grid sheet that areas will be varying even though Perimeters are same.

This removes the common misconception that if perimeter is same even for different shapes area will be same.

	day1	day2	day3	day4	day5
9:30	Intriduction by students	Let us talk about Puppet characters	Introducing Tangram	Magic Magnet	Symmetry and play with Mirrosr
		show puppet video	show video if possible	Each will get 6 magnets for play	
					symmetry lines in the class
	Name your favorite Flower, Animal			Each group puts differen material	enact symmetry
				in envelops others find using magnets	
				results are tabulated	
10:30	Circle exercise	Lets draw the Puppet face and body	Lets make Tangram images cats and other animals and make a story	Make a floating	write your name in mirror image and verify with mirror
				pencil with ring magnets	
					1
		Move to workshop			make a figure using folded merrors. i
11:30	Show typical composition	Introduction to Bamboo	maths with tangrams		others decode
	Collect leaves etc		make sqares with 2.3.4.5.7 pieces	make a magnet floating column	
		Make bamboo strip for puppets	letter E in two ways		make a Kaleidoscope
			tan fractions		
12:30					
Lunch					
1:30	make composition	Lets make a puppet			make a puppet show at the end
			Make same perimeter (48 units) linkage in bamboo		
			5linkages by 5 groups	Visit Community and show them the	

What
actually
happened in
the workshop?



The School
was located
at a beautiful
place with
a view of
the hills at
distance.



Day1

Initial day had the starting troubles. This was like all other public events which take place! We could not get the School which was planned. Finally the school we got was not very near but in a beautiful location. People gathered in the Uravu Eco Links(UEL) Office. Some parents had come with kids . UEL office had a hall and LCD projector.

We had a brief inagural session. Sivaraj introduced me and gave brief on the workshop. On my request Baburaj (Uravu president at that time) gave an introductory talk.

We moved to the school and started off with our sessions. Children were paired into groups of 2. They were asked know about their partnenr and introduce to all. This became a warm up session. As the session started late we moved to the next task1



Composition with Leaves

The task given was to make a bird, insect, animal or reptile with leaves, figs, etc with out cutting them.

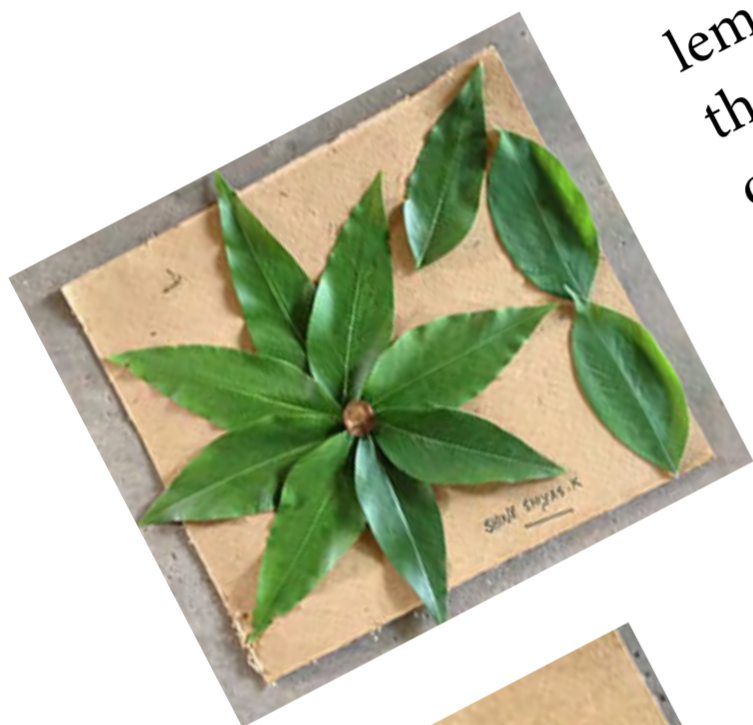
Children were asked to collect leaves to make a composition before lunch. Due to technical trouble we were not able to use the LCD projector. IPAD was handy. I managed to show some pictures done earlier. Remya assisted me through out the workshop.

I created this exercise earlier for a workshop with elementary school teachers. It is very effective and needs 'frugal resources'!





Children had no problem in understanding the task! They all came out with quite imaginative figures. Rich natural surroundings made them pick up variety of leaves. Not much of 'Imitation' was there!





We asked each participant to present their creation. Some had exposure of this kind. Other 'shy ones' slowly picked up the courage. In Studio learning it is a common practice to present one's work. Schools have yet to adopt this mode.

Personality development goes hand in hand with language learning and loosing the stage fear!



Day 1

Day 2



Day2 started off with the task of 'Puppet Making', for this I have been using my friend Sudarshan Khanna's book on Folk toys of India. I showed the children a puppet made of Card board with hands and legs with bamboo strips. We managed to show video clipping of puppet story made by children in our earlier workshop. We asked children to work on a story and present to the group.

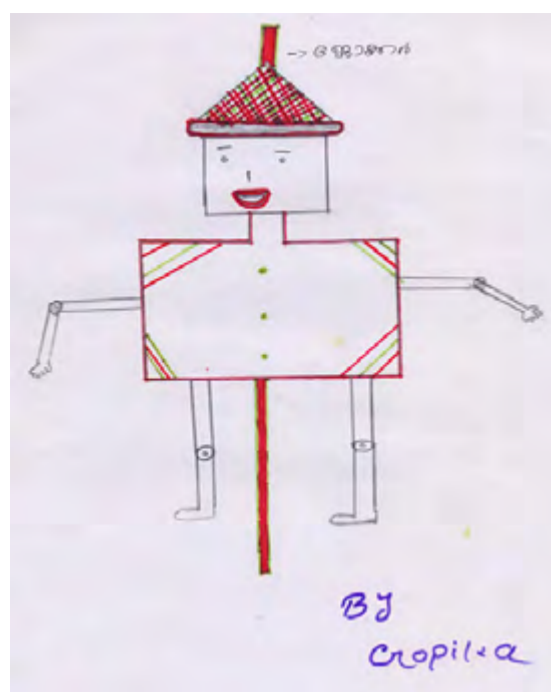


Remya, a post graduate in Science, assigned by AFRC conducted the sessions in Malayalam.



Anil took initiative to charge them! It is important to reach out to the children in their familiar language in the initial days.





Each person created a character and named it. A picture of it was drawn in the puppet structure. Each group made a story with the characters. Except one group rest wrote the story in Malayalam, their mother tongue. They recited the story after announcing their characters. Girls were leading in writing down the stories.

It is important to encourage children to imagine in their own mother tongue to carry the cultural flavour! I had to operate with the help of other facilitators as I had no knowledge of Malayalam. Interestingly it was not a hindrance.

• ലോക നരീകൻ
 ടിപ്പിങ്ങ് ടിപ്പിങ്ങ് ഒരു സന്തസ് കർമ്മാർത്ഥമായി.
 - നിന്നു. ഈ സന്തസ്സിന്റെ മൂലമായി വളരെ വളർത്തു-
 - യിനിന്നു. ഈ സന്തസ്സിന്റെ ഭോജിപ്പിച്ചു നന്നായി.
 - നിന്നു കർമ്മാർത്ഥം, ഭോജനം. അവൻ വളരെ ഭയം
 കാലമായി നല്ല സാഹചര്യം ഉണ്ടാക്കുന്നവനായിരുന്നു
 ഈ സന്തസ് മൂലമായി കർമ്മാർത്ഥം
 ഭോജനത്തിനെയും വളരെ ഭയം കർമ്മാർത്ഥം
 - യിനിന്നു. ഈ കാലമായിരുന്നു നാട്ടിലെ നരകത്തിൽ
 പർവ്വതം വന്നത്. അപ്പോഴാണ് സന്തസ്
 മൂലമായി കർമ്മാർത്ഥം കർമ്മാർത്ഥം
 ഭോജനത്തിനെയും ഭോജിക്കുന്നത് പർവ്വതം
 - മാനം കർമ്മം അപ്പോഴാണ് സന്തസ് പർവ്വതം
 - മാനം സന്തസ് കർമ്മാർത്ഥം കർമ്മാർത്ഥം പർവ്വതം
 - യിനിന്നു കർമ്മാർത്ഥം ഭോജനത്തിനെയും
 നരകം.

group: ~~Abdullah~~ Islam bin
Adheeb bin Al-Farid
Cepiwa Cepiwa (Abdullah bin
Muhammad RASHID





1. On 2nd day afternoon children made a visit to Uravu craft works. Next day morning they started actually working with bamboo. Master craftsman Rakesh Lal showed them how to use the tools. The two mini tool kits which I had sent were taken out and used. A pencil drill was fascinating to children. It was the first time they were working with their own hands using tools to make things in bamboo. They made the hands and legs for their puppets.



Day 3

Day 3



In the afternoons, It started raining every day, adding to the beauty of the surroundings. We had to end up the workshop early as the power supply was cut off an hour before the rains. It became dark in the Class rooms! Improvisation becomes the key! Since we could not use class rooms, we made a Tan-gram in large scale on the ground with rope and stones. Concept of scale gets reinforced with this kind of experiential session. Children love to do anything on the ground where they can freely move around. Soon after, it started raining.



Tangram fractions Game

Children were introduced to Tangram. Previous day they had seen a film how various figures could be made with Tangram. Before ending the session, they also constructed a huge Tangram on the ground!

4th day they made different tangram pictures with their own imagination. Later they were given number of small tan figures on a sheet to be tried at Home!

Fractions were introduced using tangram. They could solve fraction additions and subtractions using Tangram pieces.

Fraction game with tangram pieces was played in smaller groups. A simple version of game of completing a Tangram with a die in turns made them familiar with fractions and area. It was easy to understand half, one fourth, one eighth and one sixteenth by folding a sheet.

Each person was given a Tangram to take home!



Day 4



Theatre Experience

We got some time to fill up on fourth day. In the improvised schedule we had story making and enacting with puppet characters before they made the actual puppet. They could make the story and read out. But body inhibitions remained.

So we had a 'mirror -mirror' session. In this two people face each other. One becomes a mirror image of other. Whatever one does, mirror image has to enact. There is a lot of fun in this session. Soon, roles are reversed. Once they get into the session, people lose all their inhibitions!

Day 4

Puppet story sessions which were not finished on Day2 got boosted with this session. Children enacted better in their puppet character stories.





On fifth day morning session was 'Magic of Magnets'. An animated video on 'Load stone' was shown. A science session was conducted. There were envelopes with unknown material inside. Without opening each student has to find out the nature of inside material, whether it is magnetic, non-magnetic or magnets. they were given a magnet to find out. Each student wrote on the board after seeing the material in the envelop..

They were given each 6 ring magnets previous day to play and experiment. One of the ceramic magnets broke.

This led to an interesting question what happens to polarity of the broken pieces. They discovered that it becomes two magnets each with north south polarity. Later they made a floating pencil with ring magnets. (ref:www.arvindguptatoys.com) . Children were asked to visit some families in the village , show the floating pencil and ask their views: whether it is a Magic, Supernatural power or Scientific property. Children wrote their experience of interaction.



MAGIC OF MAGNETS



in the remaining time in the afternoon children formed into 3 groups. They were given a constant perimeter linkage. Each group made rectangle of different size and found out the area.

Some didn't know how to measure area. A grid sheet of 1square centimetre was given to them, on which they drew the figure and counted the squares.

A later discussion by Sivaraj in Malayalam helped them to fully understand and remove the general misconception that if perimeter is same area will be same even if the shapes are different.

They observed that with linkage which had a perimeter of 48 cm., a square with a side of 12cm had the biggest area of 144sq.cms Rectangle with side 16X8cm had area of 96., and rectangle of 20X4cm had an area of 80sq. cm.

They enjoyed the magic of mathematics!



The workshop ended bringing great enthusiasm in children and elders alike! Many from Urvu worked behind the scenes. Anil and Laila ensured public presence by inviting reporters from Mathrubhumi. The event was covered on local TVnews.

Press coverage was there in Malayalam papers. Deccan chronicle covered in English.

Mathrubhumi had video coverage , but with a mistake in my name.

A G Rao became A K Rao

the video linkages:

<https://youtu.be/NlSGnX7-AXw>

<https://youtu.be/d3MQFxuuv0I>

INTERPRET VISUALLY

Professor A.G.Rao's method helps them learn lessons

Here students learn maths through art and craft

Prof. AG Rao interacts with children at workshop. —DC

DC CORRESPONDENT
WAYANAD, APRIL 19

It's a new way of learning Maths and Science through play, art and craft. Aiming to sharpen children's reasoning ability through creative thinking is Professor AG Rao whose five day long workshop titled "acting hands and making minds" is introducing children to the mundane world of maths through more playful and artistic mediums.

"Art and craft are essential for cognitive growth in children. Learning of Mathematics and Science can become easy when it is introduced through play and 'doings with hands," says Prof Rao . The workshop, which concludes on Sunday, aims to tap children's inherent potential and improve their Maths and Science learning skills through specially designed tasks and activities.

Participating in it are

around 25 students , who have come together to learn bamboo craft, symmetry, narratives, and how to make bamboo-puppets talk. They are also learning to make compositions with leaves and flowers and play tangram, at the workshop that also encourages visual thinking through use of mirrors and magnets.

"School education is facing new challenges today and the memory based rote learning has become outdated with

easy access to information on the Internet and digital media. In this context, the development of creativity in children is important and to keep them abreast with rapid changes in science and technology, vital," says Mr Anil Emage, one of the directors of the event , organised jointly by the Urvu Indigenous Science and Technology Study Centre at Thrikkaipetta and the Academy for Research and Communication.