

# Teachers' Fellowship Program

This report is broadly about the relationship between children and their teacher, the impact of learning and its value after examining each child's learning pattern closely.

Located 25km away from Bangalore, the capital of Karnataka is a village called Siluvepura. Near this village is a small school named "Sita school", run by Smt. Jane Sahi for the last 34 years. My name is Kamala Vasudeva. I have been a teacher in this school for the past 14 years. I taught younger children during my first couple of years here. Since then, I have been teaching science and mathematics to older children (10-13 years old).

In the current academic year, your organization has set up the teacher's fellowship program. Smt. Jane Sahi has introduced the aims and objectives of the institution to us. It has been interesting to make this report is about the relationship between children and their teacher, the impact of learning and its value after examining each child's learning pattern closely.

Even though we have made reports on child learning earlier, they were not in as much detail as the current document. Now, after having understood details about your organization, under the guidance of Smt. Jane Sahi, I have begun observing how my lessons are being understood by children and are being grasped, and how my students express what they have learned. I am making a report about these topics based on my understanding.

In the current academic year children in the age group 10 to 14 years are taught lessons on health and physical education. Students are first do physical exercises. After this, the effect on the body is discussed along with information on the internal organs of the human body.

The physical education part that includes running and other games is being taught by Santosh who is a computer engineer by profession, Santosh works as a running trainer in different schools. He comes to our school twice a week.

Preeti, a physiotherapist by profession, has five and a half years of experience at Manipal Hospital. For the last year and a half, she has been practicing in sports medicine. She and Santosh help me teach children about the human body one day a week.

Imogen, a member of Jane Sahi's family, has been actively involved in our school in science teaching – in planning and arranging experiments and she gives me constant encouragement.

Every lesson report on teaching health and exercise has been divided into the following parts - the objective of the lesson, the method followed, the activities in the lesson, evaluation, result and the teacher's final comments.

**Kamala**

# Health and physical education – 1

26<sup>th</sup> June 2009

## Objective

A discussion on “What is health?” What aspects contribute to being healthy?”

This discussion was to help us know what we needed to focus on and in which way the classes could be developed.

## Activities

Since this was the first day of the lesson, we had a discussion followed by questions and answers. This was to find out how much children knew and to see the differences of understanding. An open ended question was asked so that children had the possibility to extend the discussion.

## Method

I had the children sit together and gave them information on the lesson. This was followed by questions on health.

Teacher (Kamala): *What is health?*

Medini: *We will be healthy if we maintain personal hygiene.*

Teacher: *What is personal hygiene?*

Arun: *Bathing every day, wearing clean clothes, brushing teeth in the morning and before going to bed.*

Teacher: *To what other things should we pay attention to be healthy?*

(Note here I wanted to extend the discussion to go beyond personal hygiene and to look at health in relationship to the environment.)

Medini: *We should maintain cleanliness of our surroundings.*

Teacher: *How do you relate our surroundings to our health?*

This discussion naturally was extended between the children themselves and note how Arun built on Karthik’s observation.

Karthik: *If we have decaying things in our surroundings, we won’t get fresh air because of their smell.*

Arun: *Without fresh air, we get diseases. Therefore, we have to keep our surroundings clean.*

Teacher: *Do you think that the absence of disease can mean being healthy?*

I wanted here to guide the question to thinking about mental health and the relation of mind to body.

Medini: *Feeling hurt or feeling bad can also be called a disease, right?*

Teacher: *When do you hurt or feel bad?*

This question helped Medini think further but also involved other children.

*“When we are sad”, “when facing difficulty”, “when people close to us die”, “when we are scolded”* were the individual answers given by the children

I was looking for the word “mental” from children. But they did not use that word.

Then I questioned again - From where do you feel this sadness, pain and such feelings come from? Then Dharmaraj answered “the mind”.

I followed up by saying that anything related to the mind is referred to as “mental” and anything related to the body is “physical”.

Health relates to both physical and mental well being.

Diseases happen not just to the body but also to the mind.

I explained to them that, therefore both physical and mental well being constitute health.

### **Evaluation**

To understand how much children grasped today’s lesson, I asked them to write answers to the following questions:

What is health?

What is personal hygiene?

How does our environment have an effect on our health? What should we pay attention to, to be healthy?

What is the environment?

How do you relate the environment and our health?

### **Results**

When I looked at the answers written by the children, I found that Pavitra, Medini, Karthik had written correctly. The other three had come back without writing anything. When I asked them

the same questions, they did answer correctly in their own words the questions given. . They had neglected their homework. I asked them to write it again.

### **Comments**

Only two or three children participated actively in the discussion. The others listened passively and hesitated to express what they understood. I have to engage them further in conversation and overcome their hesitation to ensure active participation. It is important that I should encourage all the children to participate.

It was interesting to note how children did build on each others' answers. Some of the children seemed hesitant to speak but did write.

## Health and physical education – 2

**3<sup>rd</sup> July 2009**

### **Objective**

To progress from the previous lesson so as to teach the children more about health and physical education

### **Activities**

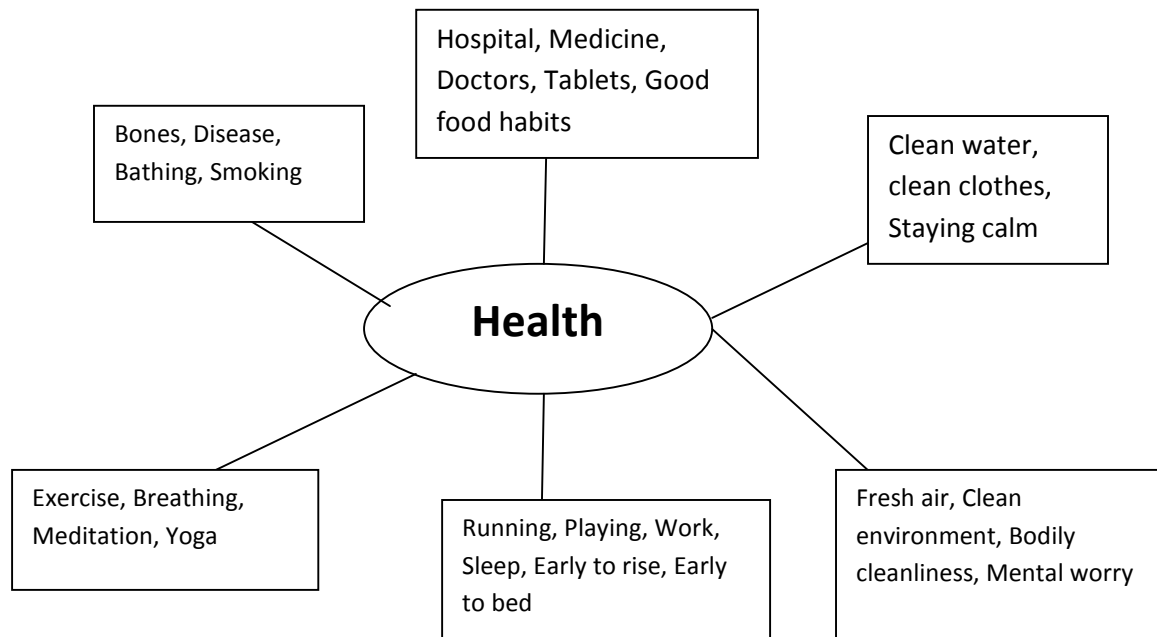
To encourage children to brainstorm by asking them different words about health. This method has the advantage of helping children to think broadly round a subject. It is also a collaborative process and everyone contributed. The teacher includes all the answers so the children feel confident to say and do not feel afraid that they may be wrong.

### **Method**

The children sat together. On a large white sheet of paper, I wrote the word “Health” in big letters in the middle. After this, I asked each of them to say different words related to health. I started writing their words on the paper.

The picture came out as follows.





**I grouped the words theme wise but another way would have been to write the words randomly and then ask the children to group them in the way they thought fit.**

To understand how the children related the above words to health, groups of three children were made and were asked to write about one of the above mentioned aspects. They were given 10 minutes to do this.

### **Results**

They were then asked to read out their understanding of the respective aspects.

Sabeera's group: (Writing about bodily hygiene) – Everyday one should bathe and wear clean clothes. Otherwise, there is odor of sweat. Teeth should be brushed twice daily. A head bath should be had twice a week.

Medini's group: (Writing about the relation between smoking and health): Smoking spoils health. It causes Cancer. The environment gets polluted. They had also written about clean water. In villages, bathing in lakes and tanks, washing clothes in them and washing animals in them cause water pollution. The same water is used for drinking. This causes cholera.

### **Comments**

Since only one from every group wrote this, it is not clear how others thought about these concepts. So, I thought it would be better to write it up independently. This would give us an opportunity to see what each individual child has understood.

10<sup>th</sup> July 2009

For students physical activities are conducted every Monday, Wednesday and Friday between 9am to 10am. Santosh is with students on Monday and Friday. On Wednesday teachers will be leading the physical activity session. There will be debates followed by teaching on Friday.

**Objective**

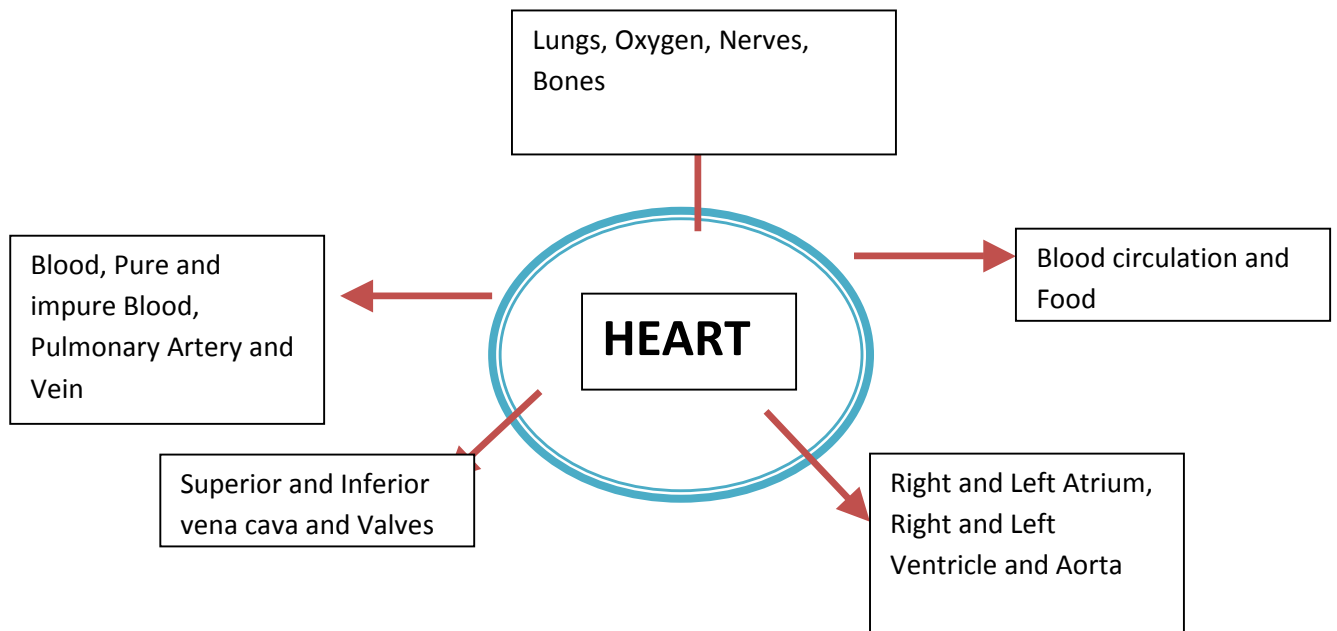
To know how much the students understand about the heart. The discussion followed on the discussion about health. We followed a similar brainstorming method but decided to get the children to write individually.

**Activity**

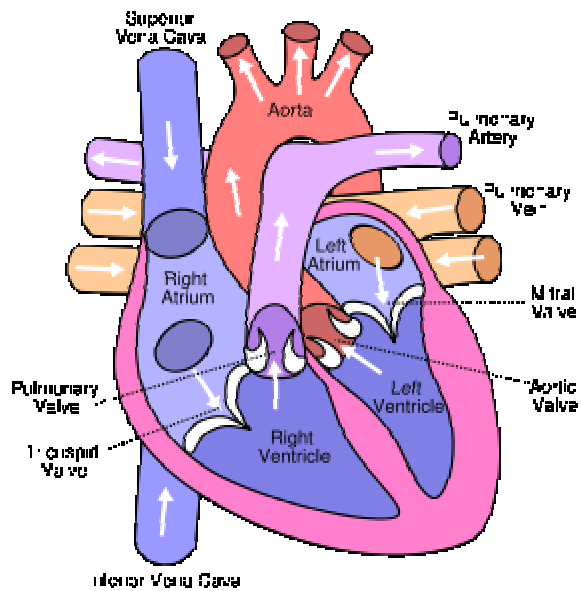
Asking students to name different words and parts related to the heart.

**Method**

After the physical activity session, students were asked to sit in a class. Students were asked to name the different parts of the heart. I wrote “Heart” in the center of the page and noted down the name of the different parts of the heart mentioned by the students.



The children were familiar with the 7<sup>th</sup> standard textbook and so knew the terms but the text has a very limited explanation. (See Appendix 1)



In this manner, the inputs from the students were noted, and the next step was to discuss how any of the above words related to the heart. We discussed how the different words related to the heart.

Different children chose to write on different words like blood circulation but Arun mentioned about bones. At first I was surprised and couldn't see the connection and thought he wasn't concentrating. However when asked he said that the rib cage protected the heart and so that was how he understood the relationship.

**Comment**

Santosh and Preeti will come on every Monday to our school to teach the physical exercises as well as help us out with health related lessons.

Students in age group of 8-10 will join senior students every Monday for the physical exercise sessions.



## **An additional class with children aged between 8 – 10 years.**

### **Objective**

We decided to show the picture of the Heart and secondly enable even the younger children to understand that heart beat rate will increase after the physical exercises.

### **Activity**

A Kannada medium CD will be played for better understanding

### **Method**

Children are taken to the computer room after the physical exercise. The heart and blood circulation picture/diagram was shown.

After seeing the picture, the younger children asked whether they too have the same heart?

This was an interesting question and we wondered why the question was asked and whether they were thinking of different kinds of pictures of the heart. They were then told that all human beings have the same kind of heart as shown in the picture

Next, the blood circulation picture was shown. In the picture, veins were shown only till the palm. After seeing the picture, Nayana asked a question – *Don't the fingers get blood?* She was told that each part of our bodies gets blood.

Another child looking at the same picture asked – *Why isn't the blood coming from lungs blue in colour* We explained to her that the oxygen that we intake into the lungs get mixed with the blood; the lungs purify the blood, hence the blood coming from lungs is not blue in colour. \*\*

Afterwards the question was asked whether this **answer** was suitable for the child's level of understanding. Did it introduce concepts that the child was not familiar with? For example did the child know what was meant by oxygen? Did the child understand the difficult concept that oxygen is mixed with blood?

Would there have been any other way of answering the question more simply? I thought that I could have put it simpler but that it is also important to begin to introduce technical terms to the children.

On seeing the picture on blood circulation, Medini asked “ Even though blood is a liquid, how does it flow upwards till the head? “ We explained that there are valves in the heart and blood vessels that open and close during the heart beat, and with the pressure exerted by the heart, it gets pushed even upwards and to all parts of the body.

In another class the concept of a valve was introduced practically and could possibly have helped to explain the valves of the heart. See appendix 2.

### **Results**

After watching the heart picture Chandan group students (9-11 age group) came to me for science lessons. I was teaching about the human body. I want to share an interesting incident with all of you.

After seeing the pictures of the heart in the computer, I began my lesson about the functions of the heart. I explained that when the heart beat stops a human being will die.

After couple of days, a girl called Anthony Mary was excited to share her experience when she came to my class. One of her relatives expired in her village. She remembered the lesson learnt in class, and went near the dead body and kept her hand near the nostrils and checked if she could detect any breath. She checked if she could detect any heartbeat and saw that there was none. I was pleasantly surprised to hear about this incident.

I was very happy that she was able to correlate breathing and heartbeat. I encouraged her and told her that wherever possible, she should apply learning in this kind of a practical way, this will help understand concepts much better.

### **Comment**

I felt that, the blood circulation picture in Kannada encyclopedia was not clear enough for the students. In the picture of the heart, only blood circulation was depicted. It would have been better to have the heart beat sound as well. I realized that before showing the C.D to children, it needs to be watched by us and only if it is complete in all respects then it should be showed to the children.

17<sup>th</sup> July 2009

**Objective**

Revise last class about heart and circulatory system and make connections with earlier class about breathing and lungs. Also the connection with oxygenated blood as pure and blood carrying carbon dioxide as impure.

**Activities**

We showed a National Geographic CD to the children.

**Method**

Today like all other days the children began with physical activity and then went to their respective classes. We used the CD to explain why our breathing rate increases when we run or after physical exercise.

We explained this to the children through pictures on the computer which was effective because the three dimensional images gave a realistic picture of what happens in the body.

It would have also helped if we had done an experiment with balloons to show the contraction and expansion of the lungs. It would have also been helpful if we had tried to link the new information with what the children already knew.

**Evaluation**

In order to evaluate how the children have understood, we divided them into groups of three and asked them to go write about lungs and breathing and come back. After 15 minutes, we read what they had written.

**Result**

*Karthik:* Lungs take in carbon dioxide and release oxygen. However, he was sure that we breathe in oxygen. Perhaps he did not observe when he was writing.

*Pavitra:* when we take in oxygen, lungs expand. When we exhale our lungs contract. She had written correctly.

Aruna & Dharmaraj group had not written correctly.

**Comment**

I thought that although the children understood they had mistakes in writing mistake in writing. The mistakes were sometimes in grammar but also a wrong choice of vocabulary.

I felt it was important that we should be clearer about what the children should write and what kind of answers we expect. Could we have guided the children by talking first or by putting key words on the board? We could have structured it more by giving sentences to put in order or to fill in key words appropriately. Also we could ask children to write definitions of certain key words and read them out to each other as riddles. (See p. in Revision Notes.)

Even though they understand concepts, sometimes their choice of words is not accurate.

Also, they do not ask about the things that they do not understand. We felt that we need to encourage them to ask more questions.

# Health and physical education - 5

24<sup>th</sup> July 2009

## Objective

As a continuation of the last class we asked the question, What is our lung capacity?

## Activities

Illustrate lung capacity through an experiment.

## Method

We discussed with all children as to how much might the lung capacity be. We asked them to estimate how much capacity their lungs have and write it down.

In normal state, we do not need a lot of oxygen intake, because during that time, our body is not using much energy. However, when we run, or do any physical activity, our body needs more energy. Hence we have to breathe in fast and thereby taking in more oxygen. To illustrate this, we did the following experiment.

Items used: 2 liter water bottle, cutter, plastic pipe, water, big basin, half liter measuring cup.

We cut the bottom of the bottle with the cutter, and closed the lid. Outside the bottle, we marked every half liter on the bottle. We placed the bottle inside the basin with the cut portion facing downward.



We pushed one end of the plastic pipe into the bottle. The other end was placed in the child's mouth. They were then asked to breathe in normally through the nose and blow out the air into the pipe. It was noted that as much of air was entering the pipe an equal amount of water would get displaced. We made all the children do this exercise and mark how much the water level dropped in the bottle. Next we asked them to take in a very deep breath and repeat the same exercise. The water level was noted.

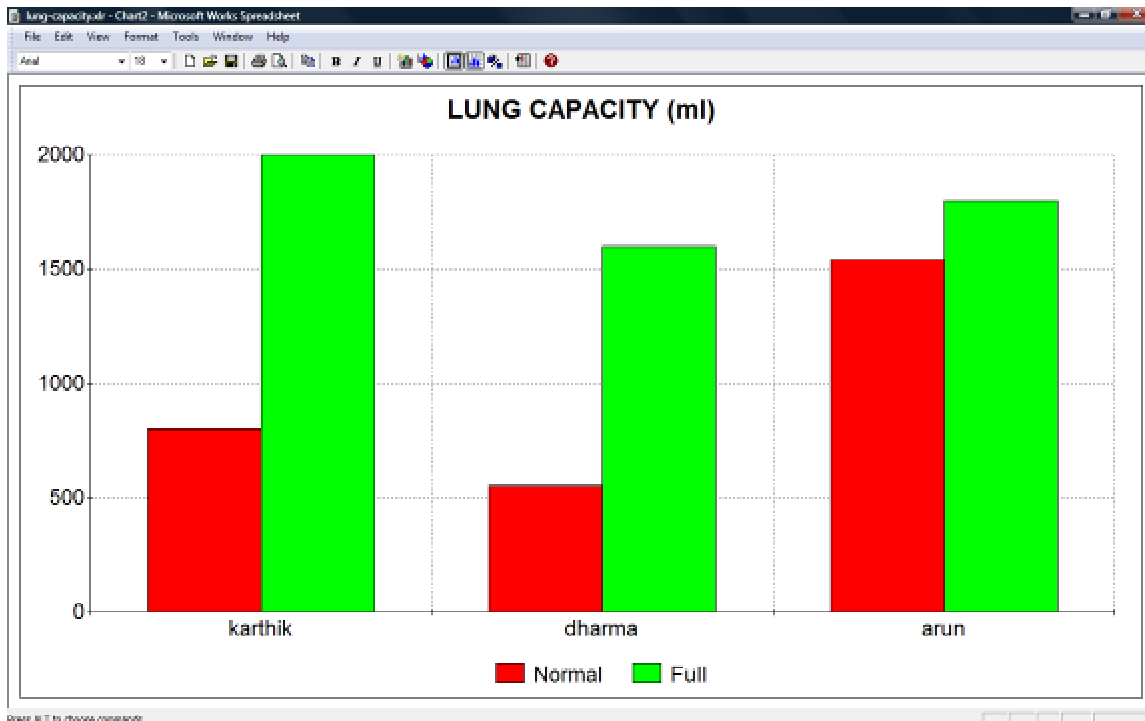
### Evaluation

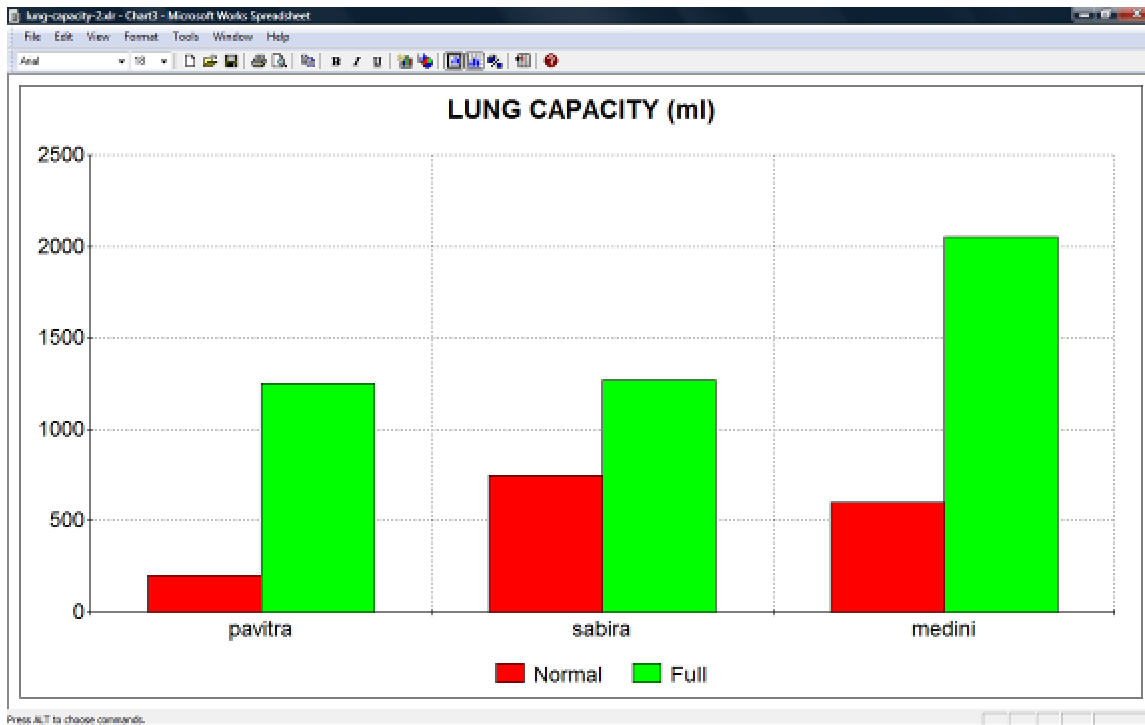
All children were asked to measure how much their lung capacities were in this experiment. Also, they were asked to discuss the same.

### Results

The children wrote about the experiment and they learned whose lung capacities were high and low.

With Santosh's help, we drew a graph of the lung capacity of all children on the computer.





### Comments

We felt that all children understood this experiment. This was shown by the way the children demonstrated and explained the experiment to a younger group of children. This was a good way of both revising and ensuring that the children had really understood.

# Health and physical education - 6

31<sup>st</sup> July 2009

## Objective

We continued with the idea of how the body changes with exercise.

Where do we measure pulse? When does the pulse rate vary?

## Activities

Running, measuring pulse rate, showing pictures on the computer.

## Method

Children were taken to the grounds. There was first a discussion about the pulse which the children were familiar with from visits to the doctor. They did not understand why the pulse was taken. They were also not able to answer a question about the link of the heartbeat and the pulse.

Preeti: *Do you know where pulse is measured?*

Children indicated a spot below the wrist on the left hand.

Preeti: *Why do we measure the pulse here?*

The children were unaware of the reason.

Preeti explained of the reason.

*The heart is on the left side of the body. The artery near the wrist is the closest superficial blood vessel to the skin surface and therefore easy to detect the blood flow hence the pulse rate is measured here. There are blood vessels on one surface of the palm also, why do we not measure pulse here?*

No one knew, I also did not know. I think that it is an important point that the teacher must also be ready to learn new information.

Since on the back of the hand the blood vessels are veins they carry blood back to the heart from the rest of the body. And since our aim is to measure the rate at which blood is being pumped from the heart to the muscles, we do not measure the pulse here.



By then children started measuring their pulse. Some could find the right spot easily, but some could not. We helped them and they also helped each other to find the right location to measure pulse.

Then everyone measured their pulse for one minute in their normal state. Then we asked them to write down how much they measured in 1 minute. Arun was not satisfied with his result and wanted to re-do the experiment.

Preeti: *We will now make you run. What do you think will happen to the pulse rate?*

This was a good way of opening an exploration rather than just telling the answer. The discussion below shows how the teacher could extend questions and how there was interaction not only between teacher and children but also between children.

Medini: *Pulse rate will increase.*

Preeti: *Why?*

Medini: *Blood circulation speed increases, so pulse rate increase.*

Preeti: *Why does the speed increase?*

Sabeera: *Because we take in oxygen faster.*

Preeti: *Why do we need to take in oxygen faster?*

Arun: *Because we get tired.*

Preeti: *If we get tired, why do we need more oxygen?*

Arun: *Because cells need more energy.*

Preeti: *After you stop running for a minute or two, what will happen to the pulse rate?*

Dharmaraj: *It will come back to the same state as before.*

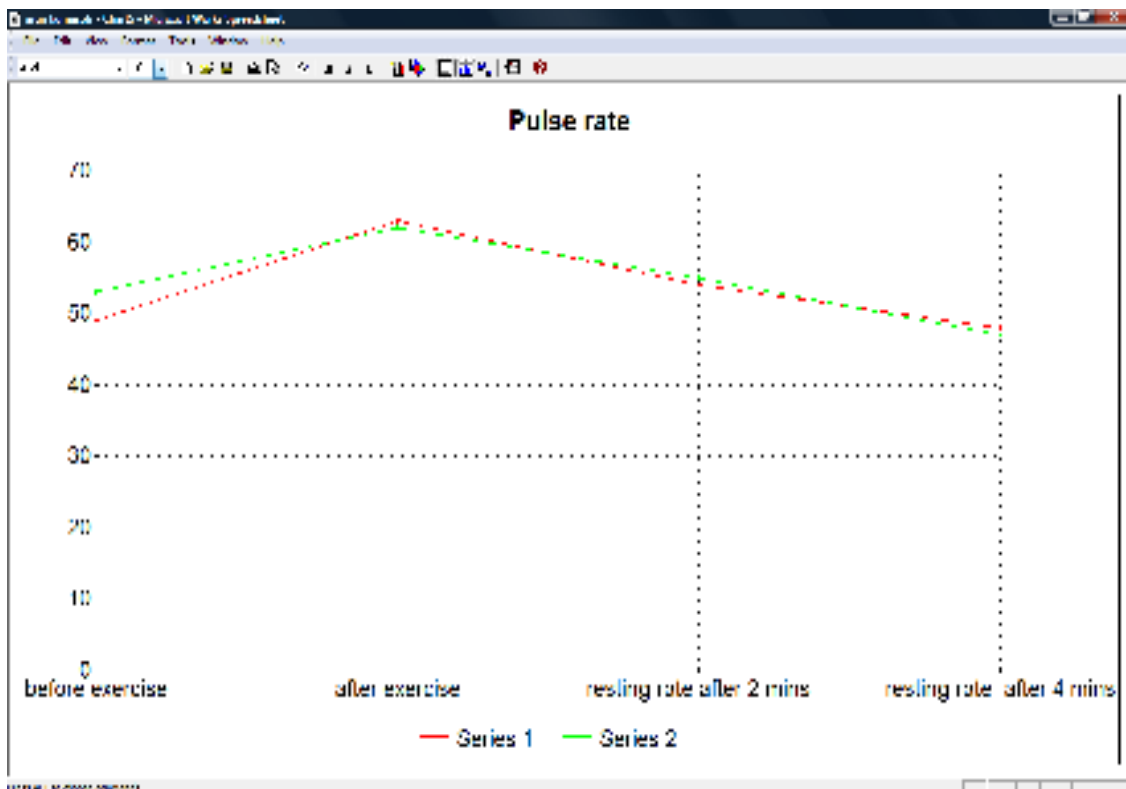
Preeti: *Is there any significance if it comes back to normal faster or slower?*

No one knew.

Although the children didn't know the answer the teacher aroused their curiosity to find out what will happen by doing a practical activity.

We began the experiment. We grouped the children into groups of three, and made them run across the ground four times. After running, we asked them to measure their pulse for one

minute. Everyone's pulse rate had increased. We asked them to measure the same after two minutes, four minutes. By then, everyone's pulse rate had come back to normal. Also, after stopping running, it was explained that the faster pulse rate comes back to normal, the heart is healthier.



## **Evaluation**

The children were asked to write down the experiment and their understanding of it.

## **Results**

All children explained that pulse rate is slow when we are in normal state. When we run, it increases. Everyone wrote this correctly. But they were not able to clearly explain why it increases. Medini was the only one who wrote this correctly and to the point.

## **Comment**

This experiment helped us understand why pulse rate increases when we run. The children understand the concept correctly, but when asked to write the same down, they get distracted by details that were not necessary. We have to think how to help children change their style of writing a narrative to a scientific record. It might be helpful if we were able to read out a good example to the children so that they became more used to the idea.

I also learnt some important concepts in this class – why do we measure pulse on the left wrist? Why is there a difference in pressure in the veins/arteries?

# Health and physical education - 7

7<sup>th</sup> August 2009

## Objective

Explain in an easy manner about lungs and breathing to all children. Also to see the different linkages between the lungs and heart.

## Activities

Teach the children using pictures of lungs, heart and arteries. The cut-outs were a very effective teaching aid and the children were engaged because they could touch and move around the parts and have a direct contact. ( the same method was used with younger children and was very effective. )

## Method

Initially children were asked to sit in a circle. In the middle, we placed pictures of lungs, heart and arteries one by one. Oxygen and Carbon dioxide were illustrated by small red and blue cards. Names of all these three parts were written on paper and placed on respective parts. Children were able to match these correctly. Then we asked them questions.

Preeti: *How does breathing happen?*

Medini: *We breathe in oxygen through the nose, it goes through the respiratory tract to the lungs. From there carbon dioxide is given out. \**

They did not know how oxygen that reaches the lungs gets into the blood. To illustrate this, we showed them pictures of breathing. Preeti asked the question as she was showing the cut outs and diagram, *“Does the oxygen jump from the lungs to the blood ?*

Preeti: *Oxygen that reaches the lungs mixes with the blood stream and reaches the heart. From here the heart pumps the oxygen rich blood to all parts of the body through the aorta and other arteries. Also, carbon dioxide from the body reaches the heart and from the heart it is brought to the lungs, from here the carbon dioxide is exhaled through the nose.*

We explained this with pictures

## Evaluation

We made all the children explain the process of breathing using the pictures, also gave them time to write this down.

**Results**

All children explained using the pictures. This was a simpler task because the children had to follow a clear sequence. Also they wrote this down correctly.

**Comments**

All the kids understood about breathing.

Different children repeated the process giving an explanation and showing pictures. This helped the children to revise in an interesting way. The cut-outs were the most appropriate visual because the children could manipulate them.

I wonder this method could be used for other science classes for example to show how the digestive system works as it was very effective.

# Health and physical education – 8

**14<sup>th</sup> August 2009**

## **Objective**

To help children understand how oxygen reaches the heart from the lungs through the blood.

Explaining heart and names of the parts of the heart, their functions, and blood circulation

## **Activities**

Picture of heart was made in cardboard, and blood circulation was explained. Then we showed them blood circulation on the computer.

## **Method**

The children sat in a circle on the ground. In the center, we placed a picture of the heart. Using this picture, we named all the parts of the heart. The picture illustrated the 2 atriums and 2 ventricles, the Aorta, the pulmonary artery, the pulmonary vein, the superior and inferior vena cavae.

## **Evaluation**

Names of the different parts of the heart were written in small cards and we asked the children to match the cards with the corresponding part in the cardboard cut out. We made all children do this activity. Initially there were some mistakes. We made the children repeat this exercise 2-3 times until they could identify the parts of the heart correctly.



Imogen had also made a 3D cut out model of the heart with all the chambers and blood vessels. But this proved to be difficult for the children to identify with. Hence we did not proceed further with the model

### **Results**

We asked a number of questions. Where does oxygen come from? Where does it enter the body first? How does it mix into the blood? After that, where does it go? Where does pure blood go? How does impure blood reach the heart? Where does it go from there? In this manner, we asked a lot of questions, and in different ways explained a number of times. After this, children were able to explain correctly. We asked them to write all this down, and they did that correctly.

### **Comments**

The circulatory system was explained a number of times and after that children understood these concepts correctly. It also helped to repeat using the cut outs and labels.

I also observed the children while they learnt this lesson – and I noticed what were the reasons that they did not understand? I also thought about what makes lessons interesting for children and how they could work with each other to learn.

Sabeera was not present for this class. When she came the next day, I asked the other children to explain this lesson to her. They all used the pictures we had used the day before. Each of them explained parts of the lesson and also asked her questions to check her understanding. She was then asked to explain the whole process. Although Sabeera got some of the parts of the heart wrong, she explained the process of breathing correctly. She also wrote all this correctly.

With this experiment, we saw that all the children understood about blood circulation and heart very well.

It was significant that the children could explain the process to someone else and revise it in this way.



21<sup>st</sup> August 2009

### Objective

A discussion about the importance of bones and joints in movements . The topic of the skeletal system was taken first so that the connection between the muscles and the blood system would be clearer.

### Activities

Movement of various joints. Showed a CD on bones and Joints.

### Method

Sat with the students from 1<sup>st</sup> grade(Santosh and Imogen were part of this lesson). Children were in 9-10 years age group (This group were being taught about the human body since July). Tried to understand what the kids know about bones through questions and answers.

Kamala: *Why do we need bones?*

Children together : *We need bones for structure, support and strength.*

Kamala: *How would we be, if we didn't have bones?*

Children: *We wouldn't have been able to stand and we would have collapsed.*



Kamala: *How many bones are there in the human body.*

Everybody knew that there are 206 bones in the human body. Bones are hard. The inside is hollow where red blood corpuscles are produced was reemphasized.

Kamala: *Even though, the bones are hard, how is it possible to fold, bend our hand, leg and knee?*

Children : *It's possible because of the joints.*

Kamala : *What would have happen if there were no Joints?*

Dharmaraj: *If we didn't have Joints, we would not have been able to do any work. We would have walked like Robots. There was some discussion about the various bones in the feet and the children could feel the bones and joints in their own feet.*

Children were made to stand in a circle, each one was made to demonstrate all joints from head to toe. Each one moved his neck, shoulder, hand, hip, knee etc . the children explored a wide range of movements including the jaws. There was a discussion about how a python can dislocate its jaws to swallow large prey. One of the children asked whether we can also do this ! This was followed by showing them about the various joints on the computer. This was particularly effective as the computer had visual images graphically showing what would happen to the body if there was no skeletal support system. They were also explained about the fluids between the joints which keep the joints lubricated . This term was introduced by taking the example of the function of grease on a cycle to stop it creaking and making motion easier.

Santosh then pretended to be eating and wanted to know what joints were being used?

Sabari, Medini, Arun and Rashmi replied that elbow and joints in the fingers were being used. Then each child was asked to demonstrate an activity. Each one demonstrated an activity and the rest named the joints being used in the activity.

### **Evaluation**

The children were questioned which joints are used while doing various exercises.

Medini replied that joints in the shoulder and hip move easily while the rest of the joints in one direction . This led on to an explanation of how different joints functioned.

There are 3 types of joints

1. The ones that move easily example Shoulder, Hip etc.
2. The ones that move in one direction – elbow, Knee, fingers etc
3. The ones that can't move such as the ones in the skull.

## **Results**

As usual, children were given 15 minutes to write about the day's lesson. None of them had written effectively and had written only a few points.

## **Comments**

The Concept has to be explained again. Children have to learn to write in a more formal way and to focus on specific points. It is necessary to ask more specific questions and also to review orally before asking the children to write. For example it would have been better if we had asked the children in response to the questions :

What are the different kinds of joints?

How do the different joints move ?

No classes were conducted between 28-08-09 to 4-09-09.

11<sup>th</sup> September 2009

**Objective**

There was a logical link to explain more information about muscles

**Activities**

Do a physical exercise to experience the muscles. Also show a multimedia (CD) related to this.

**Method**

First we assembled all the kids in the playground. Preeti asked many questions related to muscles as below.

Preeti : *Why do we need muscles ?*

Karthik : *We need them for all our movements and to do our work.*

Preeti : *How many types of muscle do we have ?*

Arun : *We have three types of muscles.*

Medini : *We have two types of muscles.*

Preeti : *We do have three types of muscles; Do you know which are these types ?*

Arun : *Voluntary, involuntary and cardiac muscles.*

Preeti then explained more; For, every activity we need muscles; Some muscles are in our control and act when we direct them and are called voluntary muscles. Some are not under our control and work when they need to and are called in-voluntary muscle. Cardiac muscles are unique as they need to work all the time and are really strong;

The children then went outside and did various stretching exercises and identified the different muscles at work.



The kids were also shown various pictures from the CD. They came to know that there are more than 600 muscles in our body. Kids had interesting questions as well when they saw the pictures; Medini asked how come the blood is blue in some picture while all our blood is red. Preeti then explained the legends used in medical pictures. Blood is shown blue in some pictures to show the carbon dioxide content, but in reality all blood is red.

Arun asked how in WWF people build up bulging muscles and Preeti explained that it is by eating more proteins and specific exercises. More oxygenated blood is a brighter red .

### **Evaluation**

As usual kids were asked write about what they learnt that day and that was examined;

### **Results**

Everyone remembered the three types of muscles; however the writing needed to be improved;

### **Comments**

Kids need to improve on writing style, structure and clear sentence formation. I thought about whether dictating notes would be better and thought that way the children would not make so many mistakes but on thinking again I thought it might stop them from understanding themselves. They also might only learn it by rote but without thinking. If we write then our sentences would be very scientific but not within the children's understanding. Even if they write one line on their own it would be better because it would be in their own words,

# Health and physical education – 11

18-9-2009

## Objective

To explain more information about Nervous system of our body and how voluntary muscles act in relation to the nerves.

## Activities

Play games to show the inter relation between Nerves and Eye

## Method

As usual after the Physical exercise children were taught lessons; The children sat around and the following game was played. Two kids were made to sit facing each other; They kept their hands up and down alternatively and the game was one kid trying to hit other kids hand while the other kid needed to escape getting hit. Children enjoyed playing that. Initially everyone got hit, but as the game progressed they learnt to avoid and escape. After the game children were asked many questions.

Preeti : *What did you notice in this game ? Why did you retract your hand when someone tried to hit you ?*

Medini : *Nerves got a message from the brain*

Preeti : *Why did you retract because of the message ?*

Sabeer : *Muscles will pull the hand back.*

Preeti : *How do you know you need to pull the hand back ?*

Pavitra : *We see it through the eye and then pull the hand back; Then the relation between nerves and brain were explained.*

Preeti : *For any activity, nerves will transmit messages to brain which in turn talks to sensory organs. A message is transmitted through the nerve to the brain from a sense organ and another nerve sends a message to the muscle to produce an action.*

Medini : *How come we don't know the transmission of these messages ?*

This was an interesting question and an example of Medini taking initiative.

Preeti : *This is good that we don't know as we may not be able to reach in time if we wait for the messages. For example if we touch a hot object and wait for the message to come from Brain and then act it would be too late and we get burnt. Then Nervous system images were shown in the computer; It showed how the message gets transferred between brain and nervous system; (Nerves themselves were explained as well; )Nerves also are of voluntary and involuntary types; Those that work according to the brains message are voluntary and some work on their own and are called involuntary.*



An experiment was done to show involuntary nerves activity; A kid was made to sit on a stool and the area just below the knee is mildly hit with a cardboard book; It was observed that the leg moved up without kids being aware of this. It was explained that in this activity the message was between spinal cord in the backbone and did not get controlled by the brain.

### **Evaluation**

The children were given the following sentences and asked to order them in chronological order.

- 1) The eye's nerve will ask the brain to pull the hand back.
- 2) Hand's muscles will pull the hand back;
- 3) Brain will transmit the message to hand's muscles to pull back the hand ;
- 4) Eye will observe the hand getting hit.

This was an interesting way of finding out if children had understood and different from just asking them to write. This was a bridge in some ways to independent writing as the children

had to think before ordering the sequence properly. It offered them a structure and yet it also required them to think. However there was a problem with Sabeera who I felt might just have been guessing.

### **Results**

Some children had difficulties to put the sentences in the right order so

the kids were made to sit and asked leading questions like what happens someone hits your hand; Kids replied eyes will observe it. Then they were prompted with the question “What happens then?” In this way by asking questions the children began to understand the whole process.

### **Comments**

Instead of making kids write every time, we need different ways of knowing if kids have understood the message.

We also need to learn more about nerves in next class.

(There was two week mid-term holiday between 19-9-2009 to 29-9-2009; No classes were held during this time)



# Health and physical education – 12

**2nd October 2009**

Today there were questions asked to revise the information learn in the previous class. Questions asked were “What happen when phone rings?”, “What happens when someone hits just below the knee?”

Arun: When phone rings, brain will ask the muscle to lift the phone and people will lift the phone.

Medini: When the book hits the knee the knee gets jerked without us realizing this. The message here comes from the spinal cord and not from the brain.

After this today’s lesson was taken.

## **Objective**

To look at the way pathways are formed to the brain and how thought processes work in the brain.

## **Method**

We devised 3 puzzles to exercise brain.



In the first game/picture a fish face was built with eight sticks; The task is to make the fish other direction by only moving three sticks.

In the second picture 9 squares are made with 24 sticks. Task is to make 5 squares by moving only four sticks.

In the third picture there are six one rupee coins in a formation. The task is to arrange them in a circle without letting any coin touch two coins.

Children tried solving them for 20 minutes but couldn't solve them. Then everyone was given a small hint. After this two of them did that. Arun tried ordering them in a circle but he was not able to. Then Preeti and Imogen explained the solution. Then puzzles were exchanged among the children. Even then they did after giving them clues. Then without further help they did them repeatedly.

Then the kids were asked questions regarding the process. The first question was how come they were not able to do them initially.

Kids : *We didn't know how to do them.*

Preeti : *How were you able to do when you were given clues ?*

Medini : *When hints are given it helps to proceed in the right direction.*

Preeti : *How come when you did it repeatedly you were able to do it faster ?*

Karthik : *Since we knew how to do we were able to do it pretty quickly.*

Preeti : *Yes when the brain thinks before each task; But when the brain knows how to do a task it doesn't have to think so the act becomes faster.*

### **Evaluation**

Children were asked to write about today's exercise.

Karthik wrote :

I was given six coins in two rows of three each. I was told to make it a circle making sure that one coin is always in contact with the others. However much I tried I couldn't manage. Medini tried to help me. Even Medini couldn't do it and then I asked Preeti for a clue. After the clue I could do it. Then Preeti asked me what I had learnt from this. I learnt that with the clues I could follow this method .

Note that Karthik did not continue to say that this would have made it easier to do subsequently because a pattern had been established in the neural pathways. He may have understood this but did not include it in his writing. The fact that he had written this in his own words made it easier to identify where he had not explained fully his understanding.

### **Results**

Children did try various ways of solving the puzzles. They were very focused. This seems like a great way to improve concentration.

### **Comments**

These kind of puzzles help thought process and act as a means to improve brain power.

## Health and physical education – 13

9<sup>th</sup> October 2009

### Objective

Since we didn't have many kids attending last week, we decided to repeat the previous class.

### Activities

Intelligence based exercises to co-relate between brain and optical nerves. Ex : drop a small piece of paper and make kids catch it, kids will sit in a circle and press hands in a consecutive fashion.

### Method

First we repeated the last week's class for new kids. Even these kids needed clues/hints to proceed. Then the following activity is played.

Kids sat in a circle and held each other's hand. On a signal, one presses the next kid's hand, the next one presses the next one and so on until it reaches back to the first kid. This activity was timed. The same activity was repeated with eyes closed and the time was noted again. The activity with eyes closed took more time.

Kids also played the catching the paper with two fingers. Initially it was difficult but after practice they were able to do it very fast.

### Evaluation

The activity was followed by a question answer session.

Preeti : *What happened when someone pressed the hand ?*

Pavitra : *I also pressed Sabeera's hand.*

Preeti : *What happened even before that ?*

Pavitra : *When Santosh pressed the hand, I understood that I need to press Sabeera's hand.*

Preeti : *How did you know ?*

Pavitra : *My brain gave me the message.*

Preeti explained that when the brain experiences something, it knows to repeat that with next person. Hence the same signal is given to the hand.

Then kids were asked what took more time the game with eyes closed or the one with eyes open. Since stop watch had recorded the wrong time, kids said the ones with eyes open. To correct this impression, game was played again and this time stop watch showed the correct time.

The kids understood the concept of how neural pathways work faster than seeing. The reasoning for this was explained. Since eye observes the activity and eye nerves are closer to brain the time taken to send the signal is shorter and hence the game becomes faster.

### **Results**

The kids were asked to write about the lessons. Only Medini wrote more fully. The others wrote what they observed and recorded the activity but didn't make the necessary inferences.

### **Comments**

Since kids need more time to write about the class, I feel it is better to ask shorter questions than the whole report of the class. It would have helped if we had asked very specifically for the children what they had learnt from this activity. Also we could have reviewed and discussed the learning in class before asking the children to write.

# Health and physical education - 14

16<sup>th</sup> October 2009

## **Objective**

This class was an introduction to nutrition and its importance on building up energy in the body. The aim was to understand what the children know about digestion, and then explain the process of digestion to them in a systematic manner.

Although we took digestion first we thought afterwards that it might have been better if we had discussed nutrition before and make the links with health and exercise .

## **Activities**

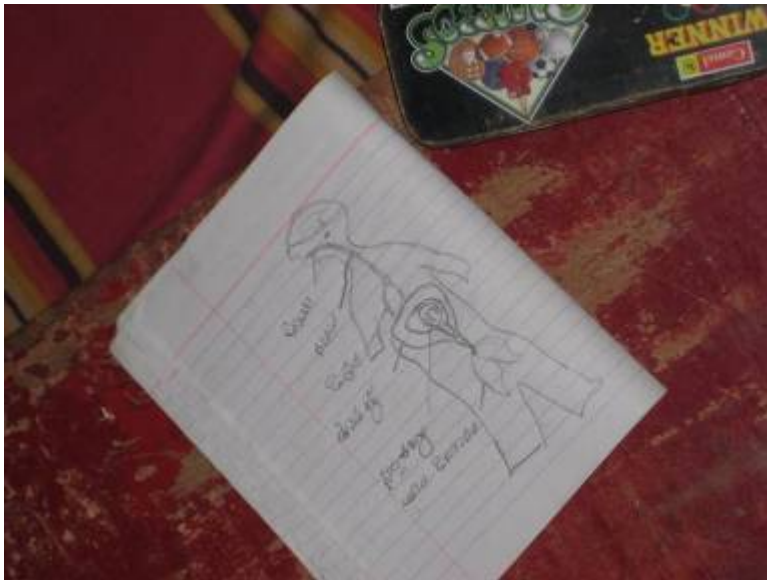
Explain the process of digestion through pictures, and then educated them by playing a CD on the computer. Additionally, explain the process and different digestive parts by drawing on a large white paper, and have the children identify the different parts.

## **Method**

We first asked the children what they knew. There were some confusions which we traced back to a confusing diagram in the 7<sup>th</sup> standard text book which seemed to suggest that food passed through the large intestine first. Also the children did not mention the role of enzymes.

As a way of clarifying what children already knew the children were asked to draw pictures independently of the digestive system and organs involved in their books, and explain the process and functions of different organs. Subsequently have discussions with the children on digestion using the information they had given and adding or correcting information where

necessary. See the picture below.



Preeti: *What happens to the food we eat?*

Arun: *The food we eat first is chewed by the teeth and cut into small pieces. These then get mixed with saliva and goes down the food pipe into the stomach. From here food enters the large intestine and from there the small intestine.*

Preeti: *Is everything that Arun said true?*

This was a good example of opening up the question and not only relying on teacher !

Everyone said YES. They could not find any mistake in Arun's explanation, so we asked them again what happens to the food when we eat.

Medini: *Oxygen in the body absorbs the food, and this gets distributed to all parts of the body.*

We asked them "So how do we get the energy?" The children said that we get energy from the food we eat.

Preeti: *Once the food we eat gets digested, how do we get the energy?*

No one could answer this correctly. We then explained to them that the oxygen absorbs the food that is digested and releases energy.

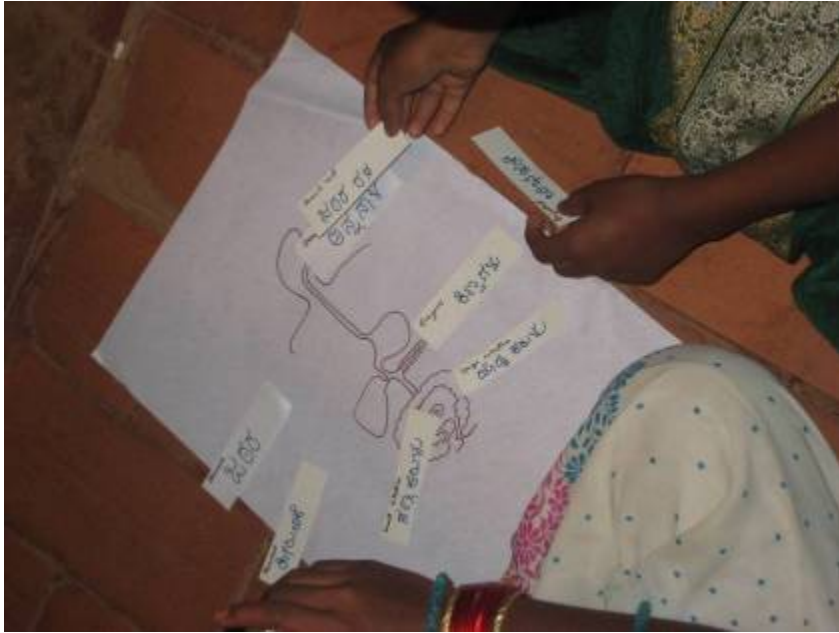


Then we showed the children pictures of digestion on the computer. These pictures explained how the food descends through the food pipe, what happens in the stomach , how the digestive juices get mixed with the food and gets digested.

We used cut-outs to help children make the connections.

### **Evaluation**

We created 3 groups of 2 children each, each group was given pictures of digestive organs, and also gave them pieces of paper with names of organs written on them. We asked them to then match the picture with the names. We then asked them to use each of the names and pictures and asked them to explain the process of digestion.



### **Results**

The teacher explained through a diagram and demonstrated how the different parts connected together. The children were able to repeat the task. It was important that the children were active with the materials and not just talking.

All the three groups had matched the pictures and names correctly. When we asked them to explain digestion process, Medini explained correctly. Karthik & Arun, Pavitra, Sabeera got a bit confused with some of the names and pictures. But all of them got the overall picture and understood the process of digestion.

### **Comments**

We think that all children understood the process of digestion. We felt that they should practice more to get the functions of all digestive organs

correctly. However the pictures and cutouts definitely helped the children both to understand and remember the new terms.



23<sup>rd</sup> October 2009

**Objective**

This linked with the discussion about digestion from the previous lesson. Understand how the food we eat helps in keeping our health and identify the constituents in each of the food items that we consume.

**Activities**

Bring different food items, vegetables, fruits, etc. and discuss about the constituents in each of these food items.

**Method**

First we brought different food products like milk, fruits, vegetables, chapathi, dals, sugar, jaggery, oil, etc. and placed them in front of the children.



We then discussed about the food with the children. We asked a number of open ended questions which meant that children participated more.

We asked them, “*Why do we need food?*” “They all said that we need food to get energy.

Preeti: *What kind of food should we eat?*

Arun: *Sugar, carbohydrates, minerals, vitamins, water. We need to have food that contains all these.*

Preeti: *Here we have so many food items, what do they all contain? Each one of you talk about one food item.*

It helped the discussion to have actual familiar food items that the children immediately connected with.

Arun: *Egg: this contains iron and carbohydrates.*

Medini: *Rice: this contains carbohydrates.*

Pavitra: *Green gram: this contains vitamins.*

Sabeera Peas: *this contains iron.*

Karthik: *Oil, this contains fat.*

In this way, each child identified the constituents in each one food item, and we discussed about each food item.

We then asked: *Do we have to eat all these food items in a single day? Should we eat the same kind of food every day? Or should each day's food be different?*

Karthik said that all important constituents should be consumed every day.

### **Evaluation**

We then asked them to identify the key food items for today in order to make today's food a complete diet with all important constituents.

Arun picked up rice, Sabeera picked up dal for making rasam, Medini & Karthik picked up other kinds of dal, Pavitra got vegetables. Sabeera also picked up fruits to eat after food.

In this manner we tested how much the children had understood about food and their constituents.

### **Results**

We had brought approximately 22 food items for the class today. We asked the students to list their constituents and their benefits. Almost all children were confident to answer this.

### **Comments**

The children did not have any difficulty in understanding this lesson on food. When they wrote all this down, they made some small mistakes about the different food groups but they got most of this lesson correctly. It helped that the question was quite specific. We could have discussed other aspects of a balanced diet related to age, habit, occupation and economic status.

# Health and physical education -16

30<sup>th</sup> October 2009

## Objective

**There was a connection to the other classes on nutrition and digestion and that led on to waste in the body.**

To explain the role of kidneys in our body.

## Activities

To show the picture of kidney in a computer and explain.

## Method

First we discussed about the kidneys with the children by finding out what they knew already.

Later we asked questions like : Where are the kidneys?

How are they? Why are they needed? The summary of the answers which the children gave were :

Kidneys will be below our stomach, on either side of the spinal chord. We will have two kidneys. It will be in the shape of a bean seed. These consists of man nephrons. Nephrons filters out the water and salt content from the blood. This filtered water and salt content will flow through the urinary tubes and is collected in the urinary bladder. It will disposed from the body from there. The children were familiar with some of these terms from the 7<sup>th</sup> standard text book.

Many children participated in the discussion and mentioned information about the kidneys.

A picture of a kidney was shown on a computer after the discussion. How does the nephron filter out water? This was explained in detail. In the picture, one person was shown who had drunk more water after exercise and another person who had drunk less water. When the urine was examined later, the urine of the person who had drunk less water was less in quantity and was slightly yellow. The urine of the person who had drunk more water was more and was clear in color.

This video was useful because it gave a very clear picture of how the nephron filters the blood.

Preeti: *Why is there a difference in the quantity and color of urine between the two persons?*

Arun : *As the person had drunk less water, the salt content in the urine was more. That is why the urine was yellow.*

Medini : *As more water had been drunk, the quantity of urine was more and therefore the color*

*of the urine was clear.*

Later the process by which the nephron's tubes filters out water and how it will take only the amount of water it requires and leaves the rest and how this process helps in maintaining a balance of water content in the body were all explained. Explanation on how the salt and water will flow in the urinary tubes to the urinary bladder and disposed from there, were given with pictures.

### **Evaluation**

This time, the children were asked to ask questions amongst themselves. This was a new idea and it proved a good way for children to clarify their doubts.

Medini : *What is the use of kidneys?*

Pavitra : *It purifies blood. It separates out water and salt from blood.*

Arun asked Sabeera : *What is kidney made up of?*

Sabeera : *I do not know.*

Arun : *Kidneys are made up of nephrons.*

Karthik asked Arun : *What is the function of nephron?*

Arun : *It takes away water and salt from the blood. It will take away the amount it requires and return the remaining amount to blood.*

Medini asked Pavitra : *Where are the kidneys?*

Pavitra : *On either side of the spinal chord.*

Medini : *What happens to the urine collected in the kidney?*

Pavitra : *No answer.*

Karthik : *It goes to the urinary bladder through the urinary tubes.*

Arun : *What will happen when you do not drink much water.*

Medini : *If we do not drink more water, the salt content in the urine will increase. The water level in the blood will be maintained.*

After the children had asked questions amongst themselves, the following questions were given for students to write the answers: What are the different parts of the kidney ? What is the function of the kidney ? What is the function of the nephron ? How do the kidneys balance the water level in the body ?

### **Comments**

The children were able to write because they had seen the video, had discussed it with the teacher but also had an oral review between themselves and the questions to answer in writing were structured. The oral review when children asked each other questions helped them to revise and included all the children in a supportive way.

# Health and physical education -17

6<sup>th</sup> November 2009

## Five Sensory Organs

### Objective

To test the students about the knowledge regarding the five sensory organs and provide more information on the same.

### Activity

Collect different objects. Blindfold the students and ask them to identify the objects by touching or smelling or by tasting them.

### Method

All the students were encouraged to participate in a discussion. The following were the questions discussed. What are the five sensory organs? What are their functions? Why do we require them? Since these were simple questions, everyone answered correctly. “We see through our eyes, hear with our ears, smell through our nose, taste with our tongue and the touch through our skin”. These were the answers given by each of the students for the various questions.

Preeti : *How does the tongue understand the different tastes? Will all the tastes be sensed at the same area of the tongue?*

Karthik: *Tongue has taste buds. The sides of the tongue detect sweetness and the tip of the tongue detects sourness.*

Arun: *No, the sides of the tongue detect sourness and the tip of the tongue detects salty taste ,*

Medini: *The back of the tongue detects bitterness while the front of the tongue detects sweetness.*

### Activity

To let the children know the interdependency of the five sensory organs, we brought fruits, vegetables, sugar, coffee powder, cinnamon, clove, cumin seeds, salt etc .Then the children were blindfolded and were asked to select one of the items present and identify them either through feeling it or smelling it .Accordingly, all the children were able to identify the item they selected correctly.

**Result:** The children realized that they could not see properly when they were blindfolded. When they were asked to identify the items, they were able to do so correctly through the sense

of touch, taste and smell. They realized from this small experiment that these sensory organs has a particular role to play.

### **Comments**

It was felt that in the future, elaborate lessons on individual sensory organs have to be taken to understand more about each of the senses and their relationship t each other.

## Health and physical education -18

10<sup>th</sup> November 2009

### Objective

As concluded in the previous chapter, the objective is to help the children understand better about each of the sensory organs.

A lesson on the Eyes was taken this week. A number of different activities related to the eyes were planned.

As all children assembled in the classroom Medini asked, “*Why does the eye burn when water enters the eye?*”

Preeti: *Burning is not caused because of water. It is caused because of a mixture of soap and water. What happens if dust enters our eyes ?*

Arun: *Tears come out from our eyes when dust enters it. Along with the tears the dust is also removed.*

Karthik: *If dust enters our eye it stings.*

### Method

A number of activities were done looking at different aspects of the eye.

### Activity One

To show the difference seen in the pupil when exposed to the light and to the shade.

Later on, the children were shown the difference seen in the pupil when exposed to the light and to the shade. To demonstrate this, a torch was brought, switched on and pointed at Santosh’s eyes. The children were asked to observe the pupils’. The torch was switched off and the children were asked to keep observing Santosh’s pupils. The children observed carefully. But they were not able to understand the difference except for Arun. He observed correctly that the pupil size became small when the light was pointed at it and it increased when the light was turned off. When the children observed the experiment again when it was done in a darker place and then they understood the concept and meaning.



## Activity Two

Blindfold the children and ask them to walk. Arun was blindfolded and was asked to walk straight. However he was unable to do so.

Preeti: *What* happened when you tried to walk with your eyes closed?

Aruna: *It's not possible to walk straight. The body keeps leaning to the side.*

## Activity Three

After this, to help the children understand how the eyes maintain the balance of the body, another activity was conducted. Medini was asked to stand on one leg with her eyes closed and then with eyes open. Once she had done both activities, she was asked about her experience. She answered that she could not maintain her balance with her eyes closed.

This was interesting because Medini was able to draw conclusions from her actual experience.

Preeti explained that, with our eyes closed we do not have balance. When we open our eyes we see everywhere. Then the body is in balance. Therefore our eyes play an important role in maintaining our balance.



## Activity Four

After this an activity was done to show how the eye adjusts to see distant objects. Different letters of different sizes were written on the blackboard. The children were called out one by one and were asked to read the letters from a distance of about 6 metres. All of them were able to read the big letters. For the very small letters which could not be read from the distance, the children were asked to come closer. They were able to read it properly. When asked as to why they could not read the small letters from a distance, the children explained that the eyes became hazy. Preeti explained that the lens in the eye adjusts to distance between the object and the eye.



## Activity Five

The next activity was to show the illusion created in our eyes. To do this, a cage was drawn on one end of a small card, and on the other end a picture of a bird was drawn. The card was pinned onto a stick and rotated. The children did the same.

Preeti: *What did you observe when you rotated the stick?*

The children replied that the bird looked like it was in the cage. The children wondered why.

Preeti explained that when the stick was rotated fast, before the first picture's image disappears from the retina of our eye, the second picture's image falls on it thereby giving a feeling that there is an image inside another image.



### **Comments**

Rather than doing a lot of activities in one day, it is better to do one or two activities. We should have prepared more carefully which activities we were doing and ensured that there was enough time to discuss and write about them.

## Health and physical education -19

27<sup>th</sup> November 2009

### Objective

Since we could not finish last week's lesson on eyes, we will be continuing with the same lesson today.

### Activity

To revise last week's lesson .To ask children to draw eye and name the parts of the eye. To show the eye's parts on the computer.

**Method** First children were taught about different parts of the eye.

Preeti: *When we see eye from outside, which parts of the eye are visible?*

Children: *Eye lashes, iris, pupil, eye brows.*

We asked Pavitra to draw the diagram of the eye and to name the different parts of the eye.

She drew the front view of the eye and named them correctly.

Then cross section of eye was drawn on the board and children were asked to identify the retina, the pupil. iris. optic nerve in the drawing.



But children could not identify the different parts of the eye in the cross section diagram. Then we showed them those parts of the eye and explained their function.

### Evaluation

Children have been asked to draw the eye and its inner parts in their books and to name the parts. And they were asked to write about the eye and its parts learnt so far.

When we read what children wrote,

Karthik: wrote that-There are four parts in the eye. They are – the retina, the pupil. iris. optic nerve helps us to see the pictures The iris lies in the middle of the pupil It becomes small in the light. And it enlarges in the dark.

Then we told Karthik that the part of the eye which becomes smaller in the light and bigger in the dark is iris and not the pupil.

Medini had written the correct answer.

Pavitra had just drawn the eye as she saw it in the computer.

Arun had drawn the eye and named the parts, but he did not explain the functions of different parts of the eye.

Arun and Pavitra were asked to write once again.

Results: From today's lesson, children got introduced about eyes and its different parts. They learned to draw the eye. But they did not write clearly about the function of the parts of eye.

**Comment** We need to explain children in different groups about eye once again in science class. And we need to remind them about “Why people wear spectacles?”, “Why our eyes blink eyes?”, “Why eyes are always moist?” etc. When we did the lesson on eye before, we had explained to them all this in detail. In this class there was not enough time.

# Health and physical education -20

4<sup>th</sup> December 2009

## Objective

To explain the ear and processes in hearing.

## Method

To heighten awareness of hearing using familiar sounds within the context of a practical activity.

To show the children the diagram of the ear on the computer.

Method: First we asked children to sit in the classroom. Once everyone assembled in the class, we asked questions like *Why do we need ears?*, *“What do you all know about ears?”*

Medini: *We need ears to hear sounds.*

Preeti: *Do you know what is there in the ear?*

Sabeera and Pavitra : *Inside the ear is eardrum.*

Preeti: *What else is inside the ear?*

Medini: *Inside the ears, there are curled tubes . And also there are nerves which send message to the brain. Inside the ear, there is a type of fluid. This fluid maintains the balance of our body.*

Preeti : *How do we hear sound?*

Arun: *We hear sound when it travels in the air in the form of sound waves and reach ear, then vibrate the eardrum .*

Since the children had studied something about the ear earlier they

knew about this subject to certain extent.

## Activity One

In everyday life we use all our senses together but in this activity we concentrated on one sense alone.

To blindfold one of the children and to ask others to ask pick up stones from different directions without letting know the one who is blindfold. The one who is blindfold should identify from which direction the other children are picking up the stones.

During the first exercise, all children could identify the direction in which sound was coming. Pavitra, Sabir and Arun identified it incorrectly for two to three times.



### **Activity Two**

Similarly, to blindfold all the children, and to create different types of sounds from behind using different things. Children should identify the type of the sound.

During the second exercise, all the children could identify the things which made sound behind them when they were blindfolded. . Medini and Sabir identified it incorrectly for two times.

Then we explained how sound waves reach ear and showed it in the computer.



## **Evaluation**

Then we asked children to write something on the lesson we did today and gave them 15 minutes of time. When we read what they had written, everyone had written the exercises we did on that day accurately. But they did not write about the parts of the ear. Therefore, children were asked to write the about the ear, its parts and the process of hearing and to bring it for the next week.

## **Results**

From the exercises they did, children learnt to identify the sounds. With the help of diagram, they learnt how we hear. But they did not write properly whatever they learnt.

## **Comments**

To make children understand better and to make them interested in what we teach, we incorporate some practical exercises in the lesson. Through the practical exercises, children learn better. However it is important that the teacher is very clear what the purpose of the activity is.



# Health and physical education –21

December 11<sup>th</sup> 2009

## Objective

To explore how the ear works and how sound travels.

To explore how the ear helps balance.

## Method

1. Use a handmade telephone with string and plastic cups to demonstrate how sound travels through vibration.
2. Use a leveling tube to show the movement of fluid in the ear.

## Comments

These two experiments helped children to understand two difficult concepts.



## Note

I was not present during this class but it was an important follow up to the earlier introduction to the activities in the previous class.



# Health and physical education -22

4<sup>th</sup> January 2010

## Objective

To discuss about the sense of smell and provide more information on the sensory organ, the nose.

## Activity

Collect different objects of various smells. Blindfold the students and ask them to identify the objects by smelling them and asking them to write it down.

## Method

To find out what the students knew about the nose, a question answer session in the form of a discussion was conducted.

Kamala: *Why do we require a nose?*

Children: *We need the nose to identify the different smells and also to breathe.*

Kamala: *How do we identify different smells ?*

Karthik: *When the smell enters our nose along with the air we breathe, we will be able to identify the smell.*

This concept was explained to the children.

Our nose consists of two parts, one for identifying the smell and one for breathing. The former part consists of cells which can identify the smell .These identify the smell and send the signal to the brain through the nerves. Then we will be able to identify the smell.

Preeti: *What type of bones do our noses have?*

Medini: *Our noses have tender bones. With this, while breathing our noses can contract and expand easily. Also we can move it in any direction we want.*

Preeti: *Why do our noses get blocked and why do we have severe headaches when we catch a cold?*

The children did not know the answer.

Preeti explained :

Our face is made up of one single bone. The places above and below our eyes where there is no bone but empty spaces, the mucus from the nose gets accumulated when you catch a cold leading to headaches, and blocked noses .

Next, the students explored their sense of their smell, the following objects were arranged without the children seeing them: Onions, Soap, Garlic, Cinnamon, Clove, Ginger, Jeera and Fevicol. The children were blindfolded and each was asked to identify the object assigned to them by smelling it. All the children were able to identify the object by smelling them except Arun, who could not identify Jeera. The children were asked to write down the name of the object they had identified.



### **Result**

The children were able to identify and write down the names of the objects correctly. Medini and Pavitra identified an extra smell calling it as “scent” or “perfume” as someone had worn the same.

### **Comments**

The activities were like a game to the children. As there was no critical or difficult concept involved in understanding things, the children participated in the activity with great enthusiasm.

We could have explored this further by a discussion on animals’ sense of smell and also to talk about air pollution.

## Health and physical education -23

11<sup>th</sup> January 2010

### Objective

To make them understand the importance of tongue. To explain, which are those different regions in the tongue for tasting different tastes.

### Activity

To make children to taste jaggery, salt to help them identify different tastes. Through the exercise, to make them understand that saliva is required to realize the taste of any kind of food.

### Method

First as usual, we started conversing in question and answer form.

Preeti: *Why do we need a tongue?*

Children ; *We need tongues to taste the food, to talk and to chew the food.*

Preeti: *What is tongue made up of ?*

Medini: *The tongue is made of skeletal muscle.*

Preeti: *What are those different regions in the tongue for tasting different tastes?*

Karthik: *The tip of tongue identifies the taste of salt.*

Arun: *The back part of the tongue identifies the bitter taste and both sides of the tongue identify sour taste.*

Preeti: *How do we realize the taste?*

Medini: *When we eat food, the signals are sent to the brain. Then our brain interprets the signals and identifies the taste. This is how we realize the taste, s*

Preeti: *What things are there on the tongue?"*

Medini: *We have small bumps on the tongue. Why do we have it?*

Preeti: *The bumps that we have on the tongue are nothing but taste buds. Taste buds are found all over the tongue. The sensitive microscopic things on the tongue sense the food and send the signals to brain. The brain identifies the taste.*

After that, we blindfolded each of the children. Then we made them smell onion but put a small piece of potato in their mouth, and asked them to identify the food they ate. Only Arun answered correctly that it was potato that he ate, where as other children thought they were eating onion as they smelled onion before eating potato.



Then, keeping them blindfold, we asked them to bring out their tongue. We asked them to clean their tongue with the tissue paper. After the tongue was dry, we put salt on few children's tongue and jaggery on others. No one could identify the taste. Then we asked them to take the tongue inside and make it wet. After their tongue was wet, we again put jaggery and salt on their tongues. Children now could sense the taste.



### **Evaluation**

We asked the children *“Why we could not sense the taste when our tongue was dry?”*, The children answered, *“We cannot sense the taste of the food if our tongue is dry. We can sense the taste only when we have saliva on the tongue.”*

When we asked them to write, they wrote about the exercises we did on the tongue today and their experiences.

Results: Children understood that, to sense the taste, saliva is very much essential. And also they understood that our nose realizes the smell faster than our tongue can taste the food.

### **Comments**

Since today's lesson was easy, children could easily understand the subject.

## Revision

A number of strategies were adopted in order to assess how much children had understood and could communicate about their learning. Although certain facts of information and a particular terminology were required the emphasis was on how children could express themselves and apply their knowledge to practical situations.

### 1. Oral presentation on the same subject and exchange.

Different classes focused on one aspect of the learning and topics such as lungs, the heart, bones and joints, digestion, kidneys were taken. For each of the above mentioned topics the children were asked to prepare a presentation using any aids that they wished.

Children were randomly selected to share and then children and occasionally teachers asked questions and made comments.

This in many ways proved an effective way of re-looking at the topics done. The children took initiative and were very much in control of the interaction. The children used a variety of means to aid their presentations including the cut outs in the discussion on digestion. Karthik used a CD on the heart and shared his understanding of the way the heart functions.

The children asked some interesting questions to each other. Medini asked Arun, “How do the lungs get affected by smoking? Arun responded by saying, “Smoke accumulates in the air sacs. “ Medini then further probed by asking, “ What happens then?” to which Arun responded, “ There is no space for oxygen and so it causes difficulty in breathing. “ Other interesting questions were “Where does the carbon dioxide go in the body ? “ in relation to the presentation on the lungs and “Why was Medini’s pulse rate only 60 ? “ This was actually on account of a mis-calculation.

It was interesting to note that when the children were interacting with each other they felt much freer to ask questions. Although the teacher’s role as facilitator and moderator was important and occasionally some children asked inappropriate questions.



## 2. Individual presentations on a related topic

The children were asked to prepare on the five senses but in the class were asked to present on two. The selection of topics was made by chance and children picked chits. This added some excitement and interest as it had an element of a game.



The children were asked to take on the role of the teacher in giving their explanations. Karthik used this to pose questions to the others and to elicit information from them which in one way was a reflection of how children viewed the role of a teacher.

## 3. Riddles

This had been introduced at an earlier stage following the class on the heart and lungs but is potentially a useful strategy which involve children at many levels. Th children were asked to prepare riddles using some of the terms of the class.

The riddles included the following :

I am a fluid. If I become less you will be come tired. I am there in everybody's body. I am inside the body but if I come outside you will be scared. – Blood.

We're two brothers that live in the same house. We always stay together. The older brother allows only good out and the younger brother lets only the bad in. – The Heart.

I am inside you. You can't see me. You can't touch me. You know I'm there because of the sound. If I were not there you would be silent. Who am I ? – the heart.

I am a king and whatever I say you must do. Every action is under my control. Without my permission you can't do anything. Every action needs my help. Who am I ? – the brain.

## 4. Contextualized questions

These helped the children to apply their learning in practical everyday situations. The questions often had a personal and humorous element which meant that children were very engaged in the class.

Examples of the questions were :

It was a very hot day. Preeti was running. She ran very fast and got a head ache. And cramps. She couldn't run any further. Why did that happen and what should she do ?

A child was taken to a doctor because she had difficulty in seeing in the night. The doctor advised her to eat nutritious food. Which particular food did the doctor suggest and why ?

I've got a friend who sometimes tells lies. She once told me a story about her grandfather. I need your help to know which parts could be true and which parts were false. She said that her grandfather was feeling very sick and went to the doctor. The doctor did many tests and told her grandfather that he has stones in his kidney. The doctor said it was because he had eaten mud and small stones with his food. The doctor said that her grandfather will have to have an operation to remove one of his kidneys and that after the operation he will always need help.

Kamala prepared some questions for the next class and these included :

- a. Why do we get out of breath when we run ?
- b. A child runs and kicks a ball. Which muscles are used ?
- c. Pavitra comes to school. She is breathing fast. What happened and what is the cause of this ?
- d. In the following actions which joints are used ?
  - Rosakka washing clothes.
  - Children eating food.
  - Arun is clenching his fist at Shabiranjam.
  - We turn our heads to greet someone.
- e. Usha is unable to see properly. She wears glasses and now she can see. Why?
- f. Raju is very pale. He is taken to the doctor. The doctor says he is very anemic and needs to eat certain foods. Which foods does the doctor advise and what is special about these foods?
- g. Latha steps on a hot coal . she yells and pulls her leg back. Why was she able to remove her leg from the heat so quickly ?

- h. Everything has a purpose. What purpose does your kidney have ?
- i. Why is it easier to do a puzzle a second time ?
- j. Why does the doctor look for the pulse on the left hand near the wrist?
- k. If your hear was a voluntary muscle what would happen?

## 5. True and false statements

Which of the following statements are true in describing the circulatory system ?

After each statement Kamala paused for the children's response.

- The oxygen goes through our lungs to the blood.
- Then the blood travels through a pipe to the right side of the heart.
- The blood goes into two chambers.
- Then from one big pipe it goes to all parts of the body.
- Oxygen is used up by a thing.
- It goes out as impure blood.
- Blood then travels through the aorta to the left side of the heart.
- From here there is one pipe to the nose.
- We breathe out carbon dioxide through the nose.

This description was made up as though a child had written it. Although there was some doubt as to whether this was too confusing in fact the children were able to correct it using the appropriate terms.

## 6. Peer evaluation

The children were asked to prepare on touch and the skin. They were asked to write a paragraph on what they knew. These were then exchanged between the different children along with a piece of paper with one child's name on it and the paper folded in half.

The children were instructed to read through each one's writing and then to make a positive comment on one half of the paper and on the other half to suggest how it could be improved either in terms of style or content.

Each child was given back his or her original writing and the paper of comments from peers. Each child was then asked to read the comments and then rewrite the description keeping in mind the suggestions for improvement.



Although this exercise was only done once it was felt that this could be a valuable tool for the following reasons:

- It was an effective way of revision because it involved reviewing the information several times but with a purpose.
- Children felt involved in each other's learning and were encouraged to make constructive suggestions.
- Children provided an audience for each other.
- The teacher was closely involved but there was a space created for feedback from each other.
- Children could read multiple ways of expressing the same thing .
- Children learnt to look critically at each other's writing and began to know what is valued and expected from a particular exercise.
- It gave the chance to improve their own writing.

### **A Written Test**

I gave fifteen questions some of which are written above. Nearly all the children wrote correctly and confidently. A number of the questions required careful thinking and the answers could not just be memorized from a text book. One girl omitted some questions that required recall of specific information but all other questions were attempted. The written test focused on understanding .

### **Conclusion**

When I first started this Fellowship Programme I felt very nervous. I wondered how I would manage and whether I was capable of doing this kind of work. Jane explained what was expected and gave some guidelines how to envision a plan and this gave me confidence and courage to go forward.

In the course of the programme as I saw the children learn I also learnt and gained some insights. Through observing the children's growth in understanding and also some of their difficulties I began to ask myself questions : Why do children hesitate or remain silent ? Why do some children not express themselves when they do understand ? What makes it difficult for children to understand ?

I have learnt over this programme Is that I have to focus on each child's particular level and way of understanding.

Earlier as a teacher I often used to point to a child and demand an answer to a question. I realize now that for some children this is not helpful and may make them self conscious and even want to withdraw so then they don't even answer what they know.

I feel that the goal is to try to include all children so that each one may be supported to come to a certain level of understanding.

### **Thinking about questions**

I realize that before the teacher gives explanations and information it is important to ask the children questions to find out what they know already so that we can build on that.

There are different kinds of questions. Some lead to only one correct answer like for example, 'What is the function of the heart?' Some questions have the possibility of many answers such as when we ask children 'What is health?'. Other questions encourage children to think and apply what they know for example, 'If a child is anemic what special food does she need? What is the important nutrient in that food?'. There are also questions that probe and ask children to extend what they know such as 'Why do we get out of breath when we run?'

We have used all these kinds of questions.

### **Introducing new vocabulary**

We have always tried to introduce new vocabulary and scientific terms in a clear and simple way. For example to say that the pulmonary artery is the pipe that takes the blood away from the heart and the pulmonary vein is the pipe that takes the blood back to the heart.

In introducing the word 'lubricate' in connection with the joints we talked about how by greasing a cycle it moves without creaking and more easily.

Something that we could do to help children would be to encourage each child to keep a small dictionary of special words.

### **Supporting independent writing**

One thing we noticed was that when we asked the children to write a summary of what they had learnt in a class it was not a structured enough task. Some children did not write in an organized way and did not always use appropriate words and style of language. They sometimes wrote in an informal, narrative style.

I felt that working in a group meant that some children did not participate and left others to do the work.

In order to improve this I think we should :

- Ask more specific questions

- Review orally before asking children to write.
- Use a structure like the cut outs so that the children could sequence their writing.
- Use peer evaluation . See note in revision section.
- Give a variety of ways for children to write.
- **Key words**

### **Participation in class and learning from each other**

We used different practical activities and everyday materials so that the children felt involved in the class. We also used games, visual aids and experiments to increase the children's sense of curiosity and enthusiasm.

The atmosphere in the class was open and the children felt free enough to raise questions and voice their opinions. In the practical activities the children often supported each other and sometimes corrected each other. This kind of cooperation was evident in most of the classes.

### **Building up confidence to speak and write**

I think the following would help :

- Do enough revision so that children are familiar with new concepts.
- Draw on children's own experience and observation.
- Make presentations to each other.
- Do demonstrations of experiments for other groups.

An important question is how as a teacher do I react to children's mistakes. One way is to help children to correct each other and not only the teacher. In another class I had the experience of asking children to write on the board the word 'ninety five'. I told the children to look carefully again as only one of the answers was correct and they were able then to correct their mistakes.

### **Acknowledgements**

From the start of the programme to the end Preeti and Santosh have given a lot of support and have been involved in all aspects from the exercises to the final evaluation. They showed how to go beyond the text book and how to give the children a broader understanding.

Imogen shared her experience and helped with the experiments and made suggestions for a number of the practical activities.

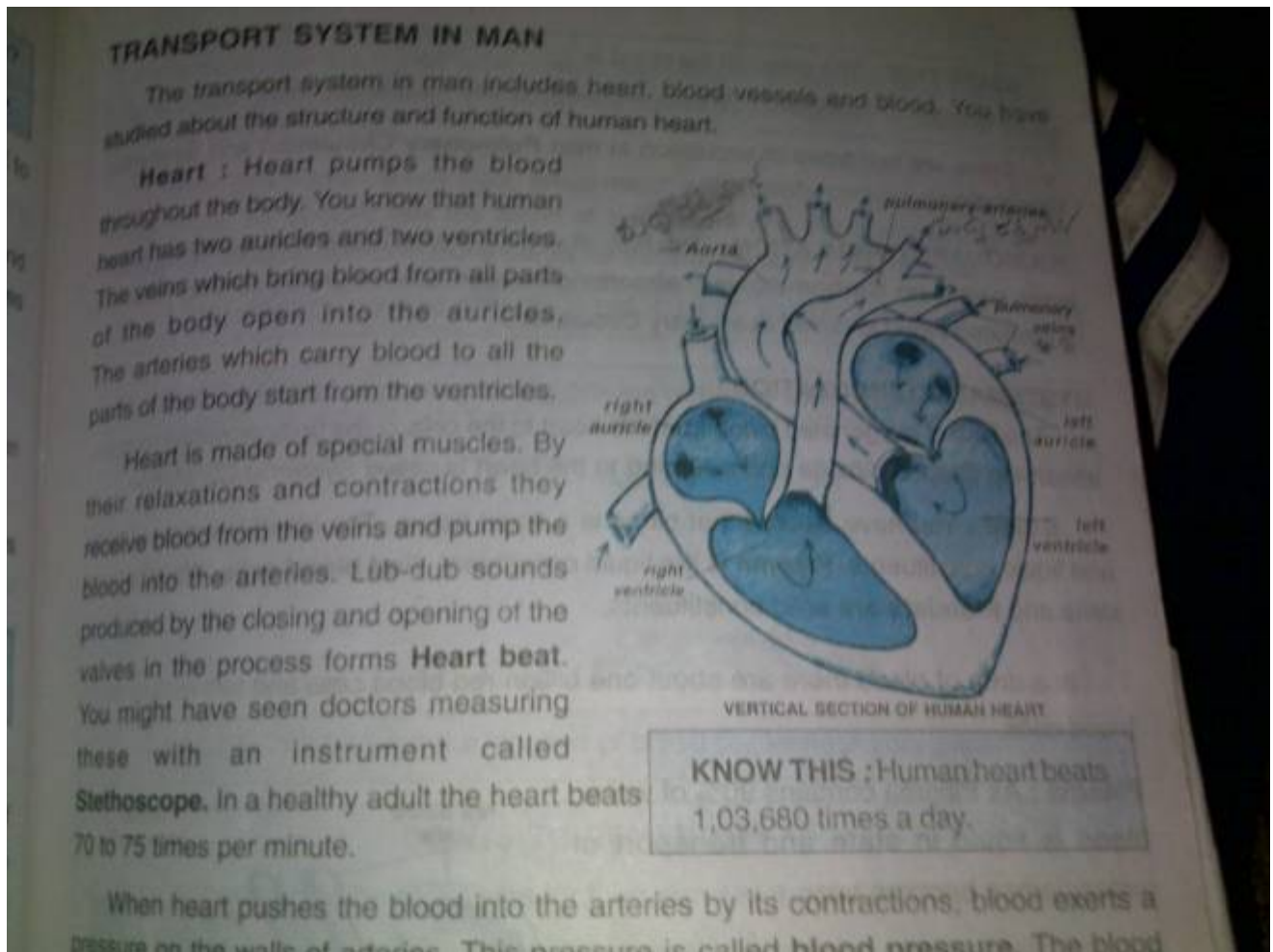
Jane gave her full support and gave a sense of direction to the programme.

Without the children this whole venture would not have been possible and I thank them for their eager and lively participation.

I would like to thank the CLLC for their support in giving me this opportunity to learn and understand more about my teaching and how children learn.

## Appendix

**1. Textbook content on heart** – the explanation was sketchy and was only one paragraph long. But, the attached image had parts of the heart mentioned with no context.



**2. Class on valves** – In another class the children had done valves. Here are some photos of drawings made by children related to the concept of 'one way flow'



### **3. Medini's diary entry for the school magazine.**

Last July Preetiakka and Santoshanna came to our school. To teach about health and exercise. We already knew about their coming so we were curious to meet them.

First of all Santoshanna taught us six exercises which we did with our feet and legs. Afterwards we ran to the nearby mango grove. After we returned we did more exercises. Sometimes Santoshanna taught us new games and we liked those games. Santoshanna gave us white shoes, socks and also white Tshirts. Now he is taking computer classes also.

Preetiakka is helping our teacher to teach about parts of the human body. This was partly revision of things we had done last year.

This year Preetiakka helped us to know how exercises are important for our body. She also showed the parts of the body on the computer and explained which helped us to understand more clearly.

Now each of us is acting as a teacher and teaching about the parts of the human body. While teaching we can do experiments or we can show pictures on the computer so that we can make others understand well. Also so that preetiakka can see whether we understand or not. It also helped us to know how we should start and to explain step by step the lesson and how we can teach properly.

While acting as a teacher we felt as though we are teachers. Of all the lessons I really liked and enjoyed this lesson.