



# Ishān Vikāś

**A Comprehensive Program to Introduce Schoolchildren  
from North Eastern States to High Quality Academia**

**An Initiative of  
the Ministry of Human Resource Development  
and  
Indian Institute of Technology Guwahati**

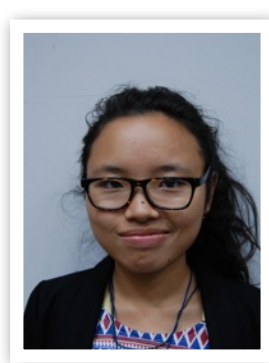
# The Students



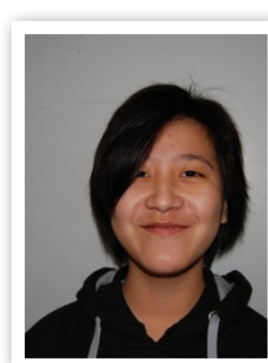
*Archana Sharma*



*Shweta Chetny*



*Tadar Yadav*



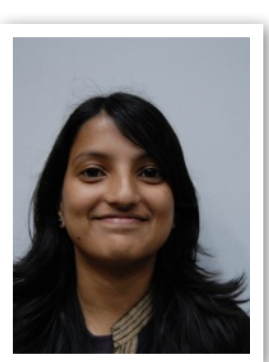
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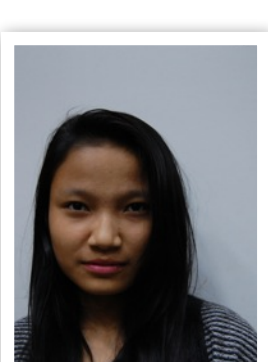
*Damini Kumari*



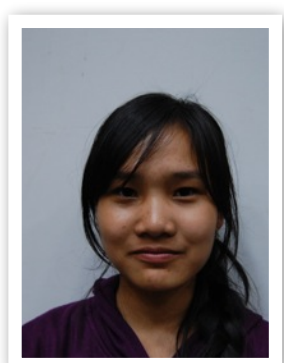
*Sukana Yasmin  
Mazumdar*



*Siddhi Srivastava*



*Ch. Nina Devi*



*Devya Aribam*



*Christina  
Khundrakpam*



*Kshetrimayum  
Meghana Sheila  
Devi*



*Anupama  
Sarangthem*



*Bhasamrita Sarmah*



*Bhanita Deka*



# Damini Kumari

## Kendriya Vidyalaya No.1 Imphal

### Manipur

The Hostel was nice; only one blanket was provided which was very thin therefore I felt very cold at night. The sister guides research scholars are very cooperative and friendly. Food was nice but I would have liked it more if roties were given in place of rice, because I love roti. I liked the Dosa in the breakfast. I did not like the shake of potato and pumpkin because potato is my favourite and I hate pumpkin and the mix put my mood off. Canteen was nice and many different food stuff is available. Math class was awesome and the teacher Sir Shaligram Tiwari was very good and enthusiastic. Sir wanted to teach us a lot but wanted to learn very little. Sir's way of teaching was such that even the person who is weak in math could understand it. Workshop was spacious and filled with big machines. Machines which are useful to day-to-day life were there. I saw drilling machine, CNC system, laser machine etc. We went to Phonetics and Phonology department with Sir Priyankoo Sarmah, we learnt about the different sounds resulting to different intensities and frequencies. Science museum was very exciting. The mirror maze made me confused. I could not make my way alone. The set up of the trunk-less body was commendable and very interesting. The manuscripts were boring but I loved the swords, sculptors,

statues and the life of Assam villages. Morning walk was very enjoyable but I was over tired and dirty. It was also adventurous. Thorns pricked my hands. I will never forget that instantaneous excitement and fun. Physics class was good. The best demonstration was the demonstration of prism. I could not understand the explanation of RC current and magnetism. The last day: In the morning we were made to share experiences and heartfelt inconveniences while my stay for 5 days in the IIT campus. After this we attended physics classes on fundamental physics and stars, galaxies and cosmology. I learnt about the fundamental force which governs the physics world, ideas about bigger boson,

chemagic. I could understand the tricks and illusions because it was based on the lessons that we have learnt already. For giving such an interesting evening, I appreciate Sir Pannalal Goswami and his team. The closing ceremony: The whole Ishan Vikas programme was winded up in a lovely and short valedictory function. The director gave an inspiring speech and we were also honoured with certificates of participation. Thanks to Sir Chandan Mahanta for showing us the lively and beautiful photos of our unforgettable walk. Love you Sumana Ma'am, Thanks to Ishan Vikash!



large Hadron collider. CIF department: We also went to CIF department. Actually we were supposed to see five machines but due to shortage of time and tight schedule I could see only four machines like NMR, Surface Area Analyzer, Laser Micro Raman Spectrometer and FESEM. Because of this visit, I came to know about different machines used behind and their mechanisms and working principle. Chemagic: The most memorable and enjoyable moment of today was the



# Archana Sharma

## Assam Lingzey Senior Secondary School, Gangtok Sikkim

### Experiences and Activities:

19<sup>th</sup> December 2014, Friday: This day was very exciting for me. I along with my mother reached the IIT campus at around 7:17 a.m. I was very curious to know what this Ishan Vikas all about was. Sumana Dutt ma'am was there to guide us. I was the only one to represent my state Sikkim and the other thirteen students were from the state of Manipur, Assam and Arunachal Pradesh. We had our breakfast at about 8:30 a.m. and then proceeded towards the lecture hall

for the inauguration ceremony. The inauguration ceremony got over at around 10:30 a.m. After that we had an interactive session that is Math talk with Professor Shaligram Tiwari, who had come all the way from IIT Madras. This Math talk was fruitful because Sir Tiwari did not teach us any new things but cleared our concepts so that we are able to understand better and perform better. I was afraid of mathematics, especially logarithms but after attending his lectures, I found it to be the most interesting and easy topic in mathematics. At 3:30 p.m. we visited the mechanical workshop where I saw machines of various shapes and sizes. It really fascinated me because I gained some knowledge from the workshop which can be utilised for doing my projects at my school. After that, we had the interactive session at the lecture hall with Sir Shaligram Tiwari, he taught us on the topic of polynomials and graphical representations. The day was over and again we returned to Subansiri hostel. For the evening activity, we had interaction among the students and the other faculties at the visitor's room. This was really nice because here all of us including our parents were together, sharing whole day experiences with each other. After this we all had our dinner and took rest.

20<sup>th</sup> December 2014, Saturday: All of us had gathered in the visitor's room at about 8:20 a.m. and had our breakfast. After that we went to the lecture hall and attended the math lecture on the topic polynomials and inequalities. I was happy because these topics, which were earlier not clear to me was clear and I knew the concept very well. Yes, the class is interesting and knowledgeable as it allows the students to know their strongest and weakest points in mathematics. This class also

cleared all my doubts related to math and gave me the confidence to solve the problems quickly and accurately. At 12:30 p.m. we took a lunch break of two hours till 2:30 p.m. From 2:30 p.m. Professor Tiwari continued his interactive sessions on mathematics. We then visited EEE department which was much more interesting than the mechanical workshop. Also, after this some cultural programme were arranged in the Bhupen Hazarika stadium. During this programme, a group of students from Manipur presented their

song . 'Raghupati Raghav Raja Ram', which was followed by a group of students from Arunachal Pradesh. Here I liked the way in which Sir translated and sang a song in different languages like Hindi, Assamese and Nepali without changing its meaning. This is really good because here in IIT, everybody has come from different states and yes, everybody was happy to listen to the song in their own mother language. This shows the respect for each and every language and not only for a specific one. After this cultural programme we came back to the hostel and had our dinner and went to sleep.

21<sup>st</sup> December 2014, Sunday: Sunday is a rest day and of course the best day. This is the day when we forget all our burdens and thus enjoy all day long. A similar thing happened in IIT Guwahati also. After the breakfast, Sumana ma'am and some of the senior students of IIT took us to the Science

Museum. This was place of wonder, a place where our knowledge about specific things doubles. This was the place where I enjoyed to the fullest, revealing the secrets behind many phenomenon in Physics, math, Chemistry and Biology which means relating to our nature and environment. It was of great fun and excitement. It enriched our skills and showed me direction towards success. We also visited the Assam state museum where we came to know a bit about the history of North Eastern states of India, especially Assam, its traditions, culture, literature and many more. In my opinion, tracing our past (history) means knowing ourselves. So, the state museum was a place where we discovered our rich heritage that is our culture and thoughts. In the IIT campus we climbed up to the view point and clicked some pictures for recollecting all the

Being at IIT Guwahati is the most memorable experience of my life so far. It is a dream come true and a golden opportunity for me. I had never thought that someday I would be at one of the best educational institution not only of India but of the whole world. IIT is a paradise; the campus is large, clean and healthy. Being here made me feel as if I am in the lap of the nature enjoying its each and every beauty. Thanks for implementing Ishan Vikas, a scheme to motivate and guide us.

beautiful memories and good times, we all shared together in this five day trip. After that we came back to Subansiri hostel all of us gathered together for dinner and then went into our respective rooms and took rest.

22<sup>nd</sup> December 2014, Monday: After the breakfast we all went for a campus tour. This was the most wild and adventurous thing for me.

Sir Chandan Mahanta guided us to the jungle where Jackals, Snakes and Leopards lived. I thought as if we were stuck in the middle of jungle and it would be difficult to find the way to come out of that wild place. But I was wrong, Sir Chandan Mahanta guided us so well. He also provided us much information regarding the environment of IIT. The jungle adventure was so good that I even took some pictures in the jungle so that I would be able to show it off to my friends after I return back to my school. In my opinion this kind of tour helps the students like us to gain our confidence and face any obstacle that block our path towards success. We climbed up the hill, had great fun and then returned to the lecture hall. In the lecture hall we were taught how to communicate effectively with others. The most important points for effective communication were:

**Always being honest in whatever we say**

**Saying in a way that even an uneducated person can understand**

**Saying in a way that even the experts cannot disagree**

Then we made a visit to the Physics lab where we were explained some of the topics like the diffraction of light and hall effect etc. Overall, Ishan Vikas is going on so well and I believe and hope that it would be even more interesting tomorrow.

23<sup>rd</sup> December 2014, Tuesday: As usual, after the breakfast, we all went out for the academic interaction. There one of the Professors of IIT asked us a few questions related to our experience and opinions. As everybody told that this programme is really helping the students like us to fulfil our dreams, I felt that I would like to stay here forever as, I did not want to return from such a clean, healthy and beautiful environment and the people with all the good thoughts and opinions. After that we all assembled in the lecture hall and Professor Subhaditya Bhattacharya and Professor Sayan Chakrabarti gave us the presentation on some of the most interesting topics of Physics like Stars, Galaxies and Cosmology. I found Physics to be of great fun. The phenomenon of gravitation was explained in such a clear manner. Then we made a visit to the CIF where we saw many huge machines like Raman Spectrometer, Scanning electron microscope, VSM, FESEM, BET, NMR etc. We were also explained the mechanism of these machines in

brief. This explanation was done by some of the senior students of IIT Guwahati. The most interesting thing that I found during these five days programme was Chemagic. As Chemistry is my favourite subject, I was very much happy to be a part of the show Chemagic, which was presented by Professor Pannalal Goswami and his entire team. He showed us many things practically that we had studied in our schools. He also gave us some information about different chemicals. I found it to be a great show. After this the valedictory session was conducted and we all were provided with our certificates. As we were guests in IIT Guwahati, special dinner was arranged for us in the guest house. I at once felt as I was in a dream. I really did not want to return, also I got motivation and inspiration to crack JEE and then enter in a beautiful environment of IIT where learning can be made fun.

Suggestions and Opinions: I would like to thank everybody behind this successful program. I know this is just a beginning and there is a long way ahead. But in my opinion, I think that it would have been better if the program was conducted for a minimum of ten days. Along with mathematics, physics and chemistry, if biology could be added then it would be of immense pleasure as there are many of us who would like to peruse higher studies in biology. I also feel that this kind of opportunities should be provided to as many students as possible because it plays a great role in shaping of one's mind and future through exposure, experience and fun. I think that these little things can be added in this program in the coming years. After all "This is just the beginning and the journey of a thousand miles begins with one step."





# Christina Khundrakpam

Kendriya Vidyalaya No.1 Imphal

Manipur

18/12/14, Thursday, We reached the Indian Institute of Technology Guwahati Campus at around 6:30 p.m. The place turned out to be quite amazing and grand. We were brought to Subansiri hostel where we will be provided with lodging and food. That was a great day. I was allotted Room. No. 119 but it was quite far from the rest of my colleagues so I decided to share room with one of my friends at Room No. 110. After a bath, I took dinner but the food I should say was not good because we Manipuris usually prefer less masala dishes. And I usually do not like zeeras being put in a dish in plenty amount. Then, we assembled at the guest room where we are asked to introduce ourselves and details about the next day were given. I slept at around 11:30 p.m.!

19<sup>th</sup> December 2014, Friday: Today, I woke up at around 6:30 a.m. and got ready for the programme. Then, I took my breakfast and around 8:00 a.m. We were guided by some students of the institute and our programme coordinator Sumana Dutt. We reached the lecture passing through those beauty carved landscapes adorn with the touch of nature. I was really amazed to see the green vegetation even inside an institute. 'Wow, that's really great! Really. Passing by each and every road, it's like walking to a garden of love and care because behind each beautiful spot, I could see the care and love of the residents towards the environment. The inauguration started at around 8:30 a.m. and proceeded up to 9:30 am. During the inauguration ceremony, the Director of the institute spoke about how the programme evolved. From 10:30 a.m. the math talk began that was delivered by a renowned teacher, Shaligran Tiwari from IIT Madras. The class was quite nice and interesting with the tactic teachings of Shaligram Sir. With his magic voice the cloud of doubt that veiled over me slowly lifted up with the welcome of a rising dawn. He made relations and function, graphs, inequalities, polynomials and logarithms more clearly and easier than before. His lessons of approaching a problem were good enough and it will really shape my life. His relentless enthusiasm, eagerness and activeness made me stay tuned throughout his class. Indeed he is an amazing figure. Anyone would have felt shy enough to doze in his class because his enthusiasm kept us freshened all day. His great talks will be my biggest key to climbing the steep rocks of success. He will always remain as my favourite teacher forever through my

life. And, the lunch break. I really can't miss it out. It was good but paneer was too spicy. I liked the salad and the mixed vegetable. I will really miss it. The visit to Mechanical engineering workshop somewhat made me boring because the explanation called for terms which was difficult for us to understand but I could grab some important facts and the uses of some machines and offcourse things beyond my expectation.

Best moment of the day: My doubts about graphs got erased. That's my happiest moment.

Saddest moment of the day: I felt for my state that hasn't got any IIT institutes. I felt eagerness to change our state and put in the pace of civilisation and development.

Feedback: Please make the dish with lesser amount of zeera and masala. No Dosa/Idli please. Please extend the length of the programme please, I like 10 days. Less time for campus tours, it is not enough!

20<sup>th</sup> December 2014, Saturday: As usual breakfast began our day. But, I couldn't eat and many of my friends too couldn't eat as the food was South Indian food. Then, we proceeded towards the lecture hall where we again had the math talk that was the continuation of yesterday's talk. There is something peculiar about Shaligram Sir: If anyone feels boring about math, his eagerness to teach and enthusiastic nature will sprinkle you, the drops of knowledge to awaken those boring minds. Truly speaking, I felt really bad and sad. I felt like crying when Sir bade us farewell. He is just a simple and special person. He will always remain forever in my mind. We also visited the EEE Department, the Multimedia department, the Robotic Department and many more. At that instant, a sense of pride spread over my whole body to think that the North-East people are no inferior to other states. I really loved the explanations of the Linguists. That night, the cultural programme is worth mentioning. The Director's wife's voice is melodious like a nightingale singing with its melodious voice.

Happiest moment of the day: Visit to the language lab and grand success of the song presentation.

Saddest moment of the day: I feel really great about my colleagues. I really think the song was good. In a short period of time, we have tried to learn the song. I felt sad and bad about the attitude of the musicians.

21<sup>st</sup> December 2014, Saturday: It was quite amusing and interesting seeing all those things in the science Museum that could be of great help in imparting us the knowledge of Science. The visit gave me an immense amount of knowledge of Physics, Chemistry, Math, and Biology. I have cracked the answer to many awkward questions on natural phenomena related to science which filled my brain. I had always thought science to be serious and fun-less subject but because of the science museum I came to know about the fun of science. We saw different marine fishes which I have never seen before. I am excited about the planetarium. It held a special for me. It seems like I was transformed from the earth to the solar system. The

mirror maze really made me puzzled. The set up of trunk-less body was also amazing and the visit to park and gardens was really

enjoyable. We also went to the state museum where the buildings of art and attics lay there representing their own times. The curator was quite good enough to explain some of the rare showcases.

But, I felt something really bad. The coins of Manipur were not as alike as we had seen. It was rather different from our experience about Manipur coins. We also watch the life of people in the villages of Assam, stone inscriptions and many more. And the lunch was really good. No dislikes of the dishes for the first time. Together, it was a day full of knowledge, gaming experience and quite funny and enjoyable.



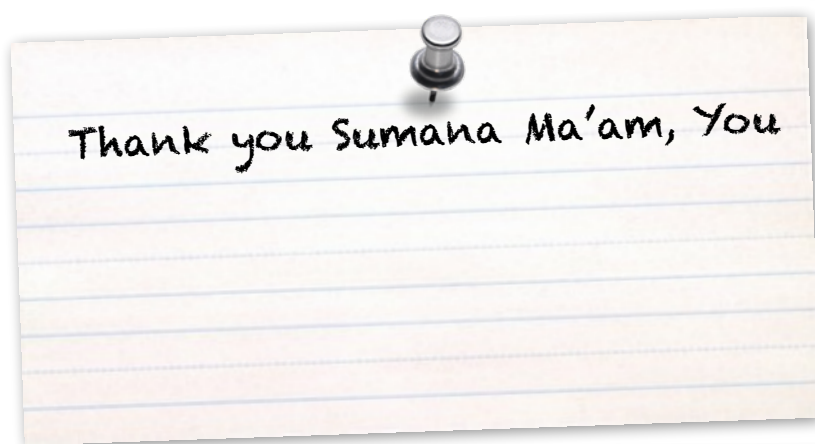
22<sup>nd</sup> December 2014, Monday: The adventurous feelings in me were discovered today when we went for a morning walk and it was amazing to see the micas, quartz etc. for the first time in my life to touch it and feel it. The guide's talk was knowledgeable and interesting. I had gained and learned facts about soil erosion, soil formation and consequences of destruction of natural resources. A yearning of photography had been instilled in me by hearing such talks. I appreciate IIT Guwahati for safe-guarding its natural greenery and environment. In Physics class I learnt a lot of things. Things were demonstrated through experiments. Physics will no longer be an unknown subject. I learnt about magnetism, prism, RC current, Hall Effect etc. The different topics were taught through fun experiments. The demonstrators cleared all our doubts and I was attracted to the world of Physics more and more. I used to have a mindset that litians and professors are always serious and absorbed only in their works but I have realised that they are extremely friendly. My perspectives have been reversed.

24<sup>th</sup> December 2014, Tuesday: As usual, we had our breakfast. Then, we went for an interaction cum conversation session where we shared our views and notions about the institute. After this we had Physics class. The first session about the fundamentals of Physics was quite good and interesting. But the second session was a little bit boring. Truly speaking I was about to doze but then I tried to control myself. After lunch we were taken to Central Instrument Facilities where we were shown instruments like Nuclear Magnetic Resonance, Surface Area Analyzer, FESEM, and Laser Micro Raman Spectrometer. I would say that the sight of the machines was fascinating but the talks and explanations were not at all convincing to me. I would say that they lack a good communication skill because every moment they would mention that we will not be able to understand and that teaching is quite difficult. But, according to the talk given by Sir, Priyankoo Sarmah, one must make someone understand in its own way not keeping in mind whether the topic contains huge bulk of unknown terms.

If someone wants to be a good communicator than one must not say that it would be difficult to teach a person about his or her subject, rather one must always try to ease the confusion through a way favorable to the hearer.

Then, there was the most amazing part of the day, the CHEMAGIC. We were shown magics based on phenomenon like surface tension. The very moment we enter the hall we were fully recharged with the blasting bombs. Each and every moment we were enthusiastic to know what will happen. I really like Professor Pannalal Goswami, his way of teaching and presentation. But, I feel sad for missing the opportunity to join the luck testing session. It was such that I was waiting for my turn, but the next moment it ended. If I would be asked on what you wished for then I would say that next time please arrange for all the participants so that everyone can try their luck. The closing ceremony was a moment filled with emotions and repressed sadness. We were given certificates. The

Director delivered a wonderful speech. With a wonderful moment, the programme came to an end.





# Anupama Sarangthem

Comprehensive Concept School, Imphal

Manipur

19<sup>th</sup> December 2014: The first day there was an inauguration function and the respected Director of IIT Guwahati gave a speech. I also got a chance to introduce myself. After the inauguration,

the mathematics class started, that was taught by Sir, Shaligram Tiwari. He cleared some doubts and added many new knowledge. He taught us very well and cleared all our doubts. He was trying to

speak in a simple language to help us understand what he said. But sometimes I was confused because due to limited time he started teaching very fast. So I have some problem because of the limited time. After this class we visited the Mechanical Engendering lab. In this lab there were many machines and the experts also explained very clearly about those machines. Later when we came to the hostel we interacted with Ma'am Sumana and her friends.

20<sup>th</sup> December 2014: On the second day Sir Tiwari continued his previous day's class and taught about the graphs of some conic section such as parabola. After this class, we visited to the EEE department and saw many interesting things. Even the robotic, we saw many interesting robots and their functions. And we also visited to Phonetics

multimedia etc. In the evening we visited the Bhupen Hazarika Auditorium for a cultural program. We got a chance to sing a song. The patriotic song 'Raghupati Raghava Rajaram' was

sung. I feel very happy because this was the first time for me to sing in Hindi.

21<sup>st</sup> December 2014: On the 3<sup>rd</sup> day we visited the Science Museum lead by Ma'am Sumana Dutta and Sabari Nath. We saw many things which we do not know such as Jelly fish, Salamander etc. From this museum we got

many information and good scientific knowledge. Then we visited the Assam state museum from there we knew about the ancient times of Assam. After all this we got very tired and came back to IIT and just took rest.

22<sup>nd</sup> December 2014: After breakfast we went for a campus tour with Sir Chandan Mahanta. We also went for a adventurous tracking. He explained us about birds and landscapes. After this Sir Priyankoo Sarmah started the communication skill class and taught us how to communicate and explained about TED videos. After the lunch break we visited the physics lab and saw some experiments. It was really very interesting.

Food: It was not very bad

I appreciate the opportunity to join Ishan Vikas program. With the help of this scheme, I have got a good chance to visit IIT Guwahati. This is the first time for me to visit an IIT. I felt very happy when I reached the place first. We lodged at Subansiri Girls Hostel, the hostel is very fine. I would like to thank Ma'am Sumana, since she is very caring as well as friendly. I will always appreciate her and thank her a lot.



Everything is fine but unfortunately we are closing in short period of time. Everything happened quite quickly and we did not get enough time to know about all the experiments. And we could not go to all the departments of IIT Guwahati. Lastly, I thank Ma'am Sumana, Sir Priyankoo, PG students (Our Senior Sisters) and other guide teachers for the valuable days with enjoyable programs. This program helped us to gain more knowledge.

23<sup>rd</sup> December 2014 Last day for closing the Ishan Vikas program: In the morning we were made to share our experiences and heartfelt inconveniences while our stay for 5 days in the IIT campus. After this we attended physics classes on Fundamental Physics and Stars, Galaxies and Cosmology. I learned about the fundamental forces which govern the physical worlds, ideas about Higgs Boson large Hadron Collider etc. We also went to CIF department. Actually we were supposed to see five machines but due to shortage of time and tight schedule we could see only four machines like NMR, Surface Area Analyzer, Laser Micro

Raman Spectrometer and FESEM. Because of this visit, I came to know about different machines used and their machines and principles. The most memorable and enjoyable moment of the day was the Chemagic. I could understand the tricks and illusions because it was based on the lessons that we have learnt already. I appreciate Sir Pannalal Goswami and his team for giving us such an interesting evening.

The whole Ishan Vikas programme was winded up in a lovely and short valedictory function. The Director gave an inspiring speech and we were also honored with certificates of participation. Thanks to Sir Chandan Mahanta for showing us the lively and beautiful photos of our unforgettable walk.



# Kshetrimayum Meghana Sheila Devi

## Kendriya Vidyalaya No. 1 Lamphelpat, Imphal, Manipur

**Accommodation:** We lodged at Subansiri Hostel. Rooms were small but well maintained and furnished. For sleeping stuffs coarse and shabby blanket were given. It was not only uncomfortable but thin because of which I couldn't sleep at night because of coldness as it is winter season.

**Food:** Food stuffs provided were just OK. It was alright for lunch and dinner except for some dishes like baby corn dish, sour chicken curry etc. I hardly eat breakfast because South Indian dishes like Dosa, Sambar, coconut chutney etc were provided. As a Manipuri I am not used to such food and I hated them. I do not eat eggs and breads were tasteless, so there were nothing much that I ate at breakfast.

**Math Class:** The math teacher Shaligram Tiwari had been very interactive and enthusiastic. He had not left even a stone unturned to teach us and made us understand but unfortunately and it is disappointing to say that I could not understand him wholly and grasp the concepts and problems properly. It must be because of my own shortcomings, my own ignorance of math and foggy and weak foundation of math. I have never made such an enthusiastic and tireless teacher but I admire him, his knowledge and aptitude of math, his words of wisdom. Honestly saying I was irritated with Sir at the beginning because of his over enthusiasm and indifference of our tiredness and laziness. But at the moment of separation I really felt sad and missed the moments of class and wished to start from the beginning. But I had to say bye Sir with a heavy heart.

**Mechanical Engineering:** Visit to mechanical engineering workshop, among towering, enormous machines would have been more knowledge and interesting if we have listened to the expert well. There were many girls and there was crowd around every machine so we had to rush. It was stuffy and could not see the machines and hear the explanation properly. It could have made possible if we were divided into groups and explain to each small group one by one but it must be because of shortage of time.

**Science Museum and State Museum:** Truly speaking I am thankful to Ishan Vikas for taking us to science center and state museum. I am much awed by the scientific set-up and displays. I enjoyed every moment at science center. I am still

hungry of science center, I am not satisfied. One grievance was that we were not given freedom to explore by ourselves and see and admire the objects slowly. We were made to rush and move further before we had properly set our eyes on the displays. I appreciate the artifacts, antiques and others of the state museum. I especially liked the set up of village life of Assam. It was heart touching and lovely not only because it resembles the Manipuri way of life but it shows the gradual development of humankind and the intricate and artful sculptures and statues. I simply loved it!

**Visit to EEE department:** We visited the EEE department and Phonetics and Phonology department where different languages are analyzed. We went to robotics, multimedia, walking chair to facilitate the handicapped persons and many other labs. I saw such wonderful things which I haven't thought in my wildest dreams. I am really awed and amazed by such scientific application.

**Morning Trek:** We took a long trek round the campus. While roaming the Sir leading us explained about the ecological system of the water bodies. The factors leading to landslides and most surprisingly Sir showed us the fragments of Mica, quartz and some other elements. We liked it and we have collected heaps of them in polythene bags from the way. It was an unforgettable adventure as we made through the narrow, dense, grassy forest glades. The grasses were tall. The thorns pricked us, the spiny, sticky seeds sticking all over the cloths, the hair strewn with seeds, grass etc. Even though it was tiring, it was a joyful and adventure through some sort of jungle.

**Physics Class:** The physics class was boring and uninteresting at first but when it came to the experimental demonstration it was exciting and superb. We girls were divided into groups of three, so we moved to different set up and could understand and observe everything minutely. The most interesting exhibits were determination of velocity of light in glass prism by spectrometer and determination of width of slit by using Fraunhofer diffraction.



**The Authorities:** The organizers and authorities of Ishan Vikas programme were very cooperative and caring. Ma'am Sumana Dutt is always found with a smiling face. She is always there to help us out in any kind of problem. Sir Priyankoo Sarmah's class on communication skills was very interesting and humorous. He really is a skilled communicator.

**Physics Classes:** In the morning we interacted with one Professor and we were made to express our experiences, memories, sadness, happiness, our views on Ishan Vikas programme and our recommendations on how it could have made better or so. I tactfully expressed my feelings and my views and experiences. The overall conduction of the programme was good and well organized. But it could have been made better if some more days were extended and enough time was allotted for each activity so that we could understand everything properly without any hurry. We also attended two physics classes on topics of Fundamental Physics, stars, galaxies and cosmology delivered by Subhadya Bhattacharya and Sayan Chakrabarti respectively. The classes were good and OK. I learnt about the fundamental forces which govern the physical world, Higgs boson, Large Hadron Collider etc. We also visited CIF department. Actually we were supposed to see five machines but due to shortage of time and tight schedule, we could see only four machines viz. NMR, Surface Area Analyzer, Laser Micro Raman Spectrometer and FESEM. I learnt about different machines, their mechanisms and working principles but the explanations were not much understandable

because the experts were very bust and impatient.

**Chemagic:** The most memorable and interesting moment of today was the chemagic but I was not awe struck at the tricks. The magic were transparent because they were based on chemistry lessons that we have already learnt and understood. Even then I liked Sir Pannalal Goswami who was performing the magic amusingly and enthusiastically. I liked the chemagic but it was not that much amazing and astonishing as I thought it would be.

**Veledictory function:** The five day long Ishan Vikas programme finally came to an end. It feels really sad! Honestly, I love the programme and never want it to be over instead I would like to start from beginning afresh. I would then improve my performance by serious concentration and exercises. And reduce my laziness and negligence. But things are only missed and hoped to improve the shortcomings after things had passed by. I am not satisfied. I could have taken even more knowledge if I had paid my full attention and dedication and commitment to it. Now I can only regret my foolishness and miss the day. The Director gave a short and inspiring speech. We participants of the programme were honored with certificates of participation. And much to my delight, Professor Chandan Mahanta showed us the photos taken in our adventurous morning walk. And finally time forcible made me bade farewell to Ishan Vikas. Reluctantly, I had to say goodbye to Ishan Vikas with a heavy heart.

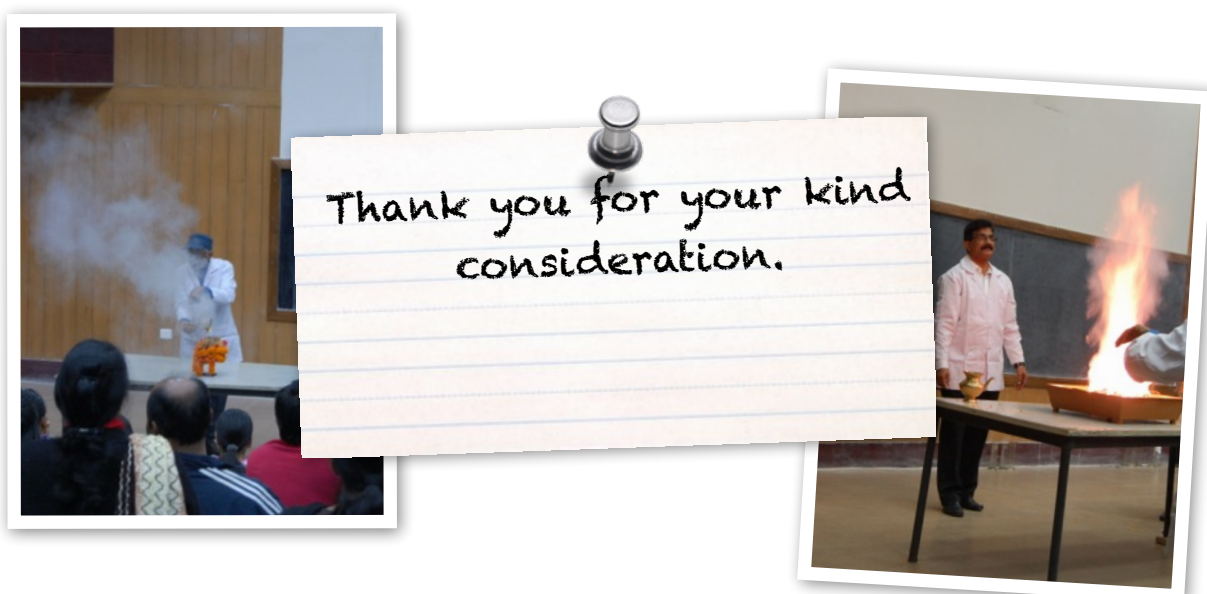


# Devyar Aribam

## Kendriya Vidyalaya No.1 Imphal Manipur

I am very glad for getting such an opportunity to participate in this program Ishan Vikash by ministry of Human Resource development. I would like to share my view that it is such an interesting program. First of all, I would like to thank IIT Guwahati for their work and arrangement in a very short period of time. On the very first day the respected Director of IIT Guwahati gave a very nice speech that inspired us a lot. The classes of mathematics are quite interesting and it clears all my doubts. But unfortunately it was only for two days. So everything is quite fast. Sometimes it was very difficult to concentrate on many topics. After that we went to mechanical workshop. All the machines are quite nice and we even got to know their principles and works. And the program students' interaction is quite fantastic and all. On the third day of the program we went to science center and state museum of Assam. The science center was very interesting and enthusiastic place for us. Many of the things are very scientific and we also saw a lots of things which we don't know it gave us a lot of information and we went to different world of science. We went to planetarium which is quite beautiful and real and 3D, which is quite funny and all. The campus is very nice and quite magnificent. On the very morning of the fourth day of

the program we went for trekking which is quite adventurous and natural. The guide teacher taught us many things about lakes, birds, soil, rocks etc. And after that we had a communication class which inspired a lot and showed us many relevant videos like TED etc. and quite funny and knowledgeable things. After that we had a physics class through experiment. Many of the experts taught us through their practical works like Hall's effect, diffraction, reflection through monochromatic and polychromatic etc. we got many practical knowledge. We went to many of the labs four mechanics, EEE, multimedia etc. lastly, I thank to all the organizer namely, madam Sumana Dutta, sir Priyankoo Sarmah, sir Shaligram and guide teachers and senior PG students and other IITians for their soul heartedly participation and helping, caring, guiding for us. But unfortunately everything is in hurry so we didn't get enough time to rest and all. And we cannot go to all the departments of IIT Guwahati. And this program helped is to gain more knowledge and it will therefore help us to progress in our engineering career and I would also like to be a part of IIT.



23/12/14

In the very morning we were made to share our experiences and inconveniences while our stay in the IIT campus.

After this, we attended physics class which is quite interesting and fun. We also went to CIF department. Actually we were supposed to see five machines, but unfortunately we were not able to do so. I see only four machines like NMR, surface analyzer, FESEM etc. Because of this visit, I came to know about different machines and their uses, working principles etc. The most interesting and enjoyable moment of today was the

Chemagic. I could understand the tricks and illusion because it was based on the reason that we know. Thanks to sir Pannalal Goswami and his team for giving such an interesting program. The whole Ishan Vikash program was up in a lovely and short valedictory function. The Director gave an inspiring speech and we were also honored with certificates of participation. After that sir Chandan Mahanta showed us lively and beautiful photos of our unforgettable work. It was such a nice part of this program. I thank all the members, organizers, guides, teachers, coordinators, seniors for their valuable works.





# Bhasamrita Sarmah

## Maharishi Vidya Mandir Sr. Secondary School IV, Guwahati Assam

19<sup>th</sup> December, 2014, Friday

We arrived at about 7:00 am and were given a room in the Subansiri girls' hostel.

At around 8:30 am we were guided by two PhD scholars to breakfast and then to the lecture hall.

The program started at 10:00 am. The welcome speech was delivered by Dr. Sumana mam.

The inauguration program and the statement of purpose was made by Professor Gautam Biswas, Director, IIT Guwahati. Firstly, he said about the history of the program. The directors of all the 15 IITs were called by the honorable President of India in August, 2014 asked them to develop and uplift the education system as well as mindsets and perceptions of the children of India. To organize programs and training sessions for the purpose. As a premier engineering institute, IITG had a task of educating and uplifting the children and minds as a part of the development of the North-Eastern region. So, IITG introduced the program Ishan Vikash for this purpose.

Secondly, this program aims to cover as many schools as well as boys and girls from all over the North-East and plans to hold around 2-3 programs per year.

Thirdly, this program aims at unfolding the latent potential among the children of the North-East by exposing them to the nature and natural laws, making them experience life at the premier educational institute, taking them to various hi-tech and sophisticated labs, holding classes, making them perceive things in a logical and rational ways as well as guide them to the right direction.

Then there was the introduction session where everybody introduced themselves to all others present there.

This time, since it is the first time, the selection was done by the CBSE. The CBSE selected a few students from the Udaan program (introduced by CBSE, basically an online coaching program for JEE, to give wings to girl students) to attend Ishan Vikash. There were 3 girls from Assam (Guwahati, Tezpur and Hailakandi) including me, 4 girls from Arunachal Pradesh (Nirjuli), 6 from Manipur (Imphal) and 1 from Sikkim. So, a total of 14 students, or rather girls.

Next we had a mathematics talk by Professor Shaligram Tiwari, who had come all the way from IIT Madras. Director sir said that he has "golden" hands. Whomever he touches gets a rank in JEE! He taught us common mathematics which are applied in Physics and Mathematics classes of plus one. What was unusual in his teachings is that he never taught us

Mathematics, he taught us the concepts of Mathematics. He started with 'modes' or 'modulus'.

Uniqueness of value should not be violated.

e.g.  $|x| = -4$  or  $4$

not,  $|x| = -4$  and  $4$

When we have  $n$  modes, there will be  $(n+1)$  intervals of solutions in an equation.

e.g.  $|x - 3| + |2x - 5| = 0$  will have three intervals of solutions.

For an equation involving modes, it is possible for the variable to have no real solution.

Next, he talked about 'Properties of Fractions'.

Every decimal number has two parts-

Integer part in  $x$  and Proper fraction in  $x$

Then he discussed on 'limits'.

Let it be a fraction. When the exponent is a natural number, then  $1 < f < f^2 < f^3 < f^4 < \dots < f^n$  the value of  $f$  increases as the value of  $n$  increases.

When the exponent is a fraction, then  $f > f^{1/2} > f^{1/3} > f^{1/4} > \dots > f^{1/n}$  the value of  $f$  decreases as the value of  $n$  increases.

Logarithms was the next topic.

$\log_b a = m$   $a = b^m$  ( $a$  and  $b$  must be positive and non-zero)

when  $a > 1$  and  $b > 1$  if  $b > a$ ; then  $0 < m < 1$  and if  $a > b$ ; then  $m > 1$

when  $a < 1$ ,  $b < 1$  if  $a > b$ ; then  $0 < m < 1$  and if  $b > a$ ; then  $m > 1$ .

If  $m < 0$ , then  $0 < a < 1$  and  $b > 1$  or  $a > 1$  and  $0 < b < 1$

Theorems of logarithm:

$\log_a(xy) = \log_a x + \log_a y$

$\log_b a = 1/\log_a b$

$\log_a x^k = k \log_a x$

$\log_b a = \log_c a \log_c b = \log_c a / \log_c b$

[Theorems are given with proofs, not been shown here.]

two types of logarithm:

Natural log the base is 'e'. [Sir explained how this 'e' is a part of log and its approx. value.] Common log ® the base is 10.

Next, we visited the Mechanical engineering lab. We were introduced to a lot of machines there.

Firstly, the lathe machine. This is one of the simplest machines. A number of other machines like milling machines, welding machine, CMC machines, laser machine and the like [I don't remember all their names.]

Lastly, we had student interaction in the visiting room of Subansiri girls' hostel. Dr. Sumana Dutta mam interacted with us. They asked our goals and aims in life, gave necessary and useful advices. Also talked about their own life experiences.

We retired to our bed.

20<sup>th</sup> December, 2014, Saturday

Mathematics classes began at 9:30 am. Professor Tiwari started with polynomials:

A polynomial of degree n can be written as

$$P_n(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \dots + a_nx^n = \sum_{k=0}^n a_kx^k = a_n(x^n + P_{n-1}x^{n-1} + \dots + P_1x + P_0)$$

For  $x = \infty$  If  $P_n(\infty) = 0$  Then  $(x - \infty)$  is a factor of the polynomial.

In general, for an  $n^{\text{th}}$  degree polynomial.  $P_n(x) = (x - \infty) Q_{n-1}(x) = (x - \infty_1)(x - \infty_2)\dots(x - \infty_n) = n!/(x - \infty_x)^{k=1}$

If a polynomial  $P_n(x)$  is considered, then

$P_n(x) = 0$  will have n possible factors.

At the most n real roots.

In case of odd degree polynomial,  $P_n(x)$  has at Least 1 real root.

In case of even degree polynomial,  $P_n(x)$  may have no real roots.

If a polynomial  $P_n(x)$  is divided by  $(x - k)$ , then the remainder is  $P_n(k)$ .

E.g. if  $P_3(x) = ax^3 + bx^2 + cx + d$  is divided by  $(x-1)$ , then the remainder is  $P_3(1) = a + b + c + d$ .

If a polynomial of degree n is divided by another polynomial of degree m ( $m < n$ ), then degree of quotient is  $(n - m)$  and degree of remainder is at the most  $(m - 1)$ .

Then, he moved onto 'inequalities'. He gave us a few formulas.

$$(x - \infty) > 0 \text{ } P \text{ } x > \infty$$

$$(x - \infty) < 0 \text{ } P \text{ } x < \infty$$

$$(x - \infty) (x - b) > 0 \text{ } P \text{ } x < \infty \text{ or } x < b$$

$$(x - \infty) (x - b) (x - g) \leq 0 \text{ } P \text{ } x \in (-\infty, \infty) \cup (b, g)$$

$x - \infty / x - b \geq 0 \text{ } P \text{ } x \leq \infty \text{ or } x > b$  (Solved for us quite a few challenging problems.)

Next he did graphical representation of

straight lines/ linear polynomials

quadratic polynomial

linear functions with mode

trigonometric functions

Then he gave us two very important but very rarely available theorems of algebra

If sum of two real numbers is constant, their product is maximum when they are equal.

If product of two numbers is a constant, their sum is a minimum when they are equal.

We went to the EEE (Electrical and Electronics Engineering) lab. We were shown transformers, robots of various kinds, et al. and explained their uses by the PhD scholars. In the power supply lab, we were told how they track problems in voltage supply etc. and try to solve those out.

Sabari Nath mam said, "If you want to deal with smaller circuits and machines, study electronics whereas if you want to deal with large machines and electric equipment, study electrical engineering.

We had gone to the linguistics lab. There we were shown a few collection of language samples from North Eastern India and told about how they are studying these and why. We were shown various softwares being developed on that basis and their usefulness.

We had an introduction session with Dr. Sumana Dutta mam and \_\_\_\_\_ who talked about life and environment at IITG. Also, the other options that IITs provide except engineering.

We had a cultural program which was started with a Saraswati Bandana and few other classical based songs. Then, the two groups of girls from Arunachal Pradesh and Manipur performed their chorus. They were superb. In the last program, we had a number of songs by Roshananda Gogoi. It was a wonderful evening.

21<sup>st</sup> December, 2014, Sunday

We went to Science Museum with Dr. Sumana Dutta mam. We had a guide with us who gave us various information on the various models placed there. We saw the mini planetarium and 3D shows. It was great fun and knowledgeable.

Next we went to State Museum, where Dr. Priyankoo Sarmah sir joined us. We saw various manuscripts, statues, coins, etc. from different era, various cultures and their lifestyles from Assam and North East India. We were well guided by Samiran Baruah, a specialist in this field.

22<sup>nd</sup> December, 2014, Monday

We had our breakfast and went out on a campus tour. We moved through the wilderness of IITG guided by Prof Chandan Mahanta. First of all, we all stopped by a lake. Prof Mahanta told us a few things about environmental engineering. He explained us how the addition of nutrients to the ponds and other stagnant water bodies adversely affects the aquatic life due to depleting oxygen levels.

Next he introduced us to the various constituents of soil found in IITG. He told us that excess of graphite in the soil can lead to soil erosion.

Then we did the most unexpected thing in IITG. We waded through the forest and tress to reach a point from where an appreciable part of IITG is visible. But unfortunately we had to return back because we came upon a cave which was frequently visited by the leopard! We proceeded to the same place through another path and that was much safer and comfortable. We clicked quite a photos there and had great fun. Prof Chandan Mahanta sir gave us a feeling of wilderness inside the campus. It is very unusual, adventurous, worth a world of knowledge and above all, great fun.

Next we had the communication skills by Dr. Priyankoo Sarmah sir. He said that he doesn't know much about this but I think he has not yet realized that he is a very good speaker. First of all, he uttered the names of a few Chinese, Japanese and Korean friends which I was not very interested to remember. But one thing he said about a Chinese friend of his which I liked the most.

There we also learnt a few things about how to speak, what to speak and something about language.

I would also like to recommend one very useful website, which he recommended to us, i.e. TED.com. It is interesting and really very useful if you want to learn something about communication.

After lunch we were taken to the B.Tech Physics laboratory. There, first of all, Padmakumar Padmanabhan sir introduced us to the six different types of experiments that we were to do and see and understand. One was the experiment of flying wheel, two experiments on optics and three experiments on electro-magnetism.

The most amazing experiment (for me) was the one involving spectroscope (mostly because I like optics) by

some bhaiya. And I really liked the 'right hand slap rule' by Shangkha da!

We had dinner and retired to bed.

23<sup>rd</sup> December, 2014, Tuesday

We had breakfast in the morning and taken to the Design department where we sat down and talked about our experiences being in IITG and about the Ishaan Vikash program.

We returned back to the lecture hall to have the Physics classes. The first was 'Physics at the fundamental scale' by Subhaditya Bhattacharya. He mostly talked about the elementary particles – quarks, neutrinos and electrons; the four fundamental forces and most importantly the Higgs particle. I do not think I had really understood much about these concepts until I heard his speech. And now I am really interested to know more about this Higgs particle. It sounds very interesting.

The second class was taken by Sayan Chakrabarti on 'stars, galaxies and cosmology'. He mainly focused on giving us a brief history of astronomy. I am really interested in astronomy and I know a few things about its history. But, after his lecture I think I heard a few unfamiliar names and I am much interested to learn about the history in much more detail. Because without knowing our past, we will not be able to predict our future well.

The visit to the Central Instrument Facility (CIF) was great (and unexpected). In fact, I never expected to see such large machines in IITG. I mean, it is only an educational institution. I always expected these machines to be there in some costly laboratories frequented by professionals only. I never even dreamt of seeing such machines as a student of class XI and it was a wonderful experience knowing about them. We saw five different machines – Raman Spectrometer, FESEM, VSM, NMR and BET.

Then comes Chemagic. We were given an explosive welcome! Prof (retired) Pannala Goswami

Then came out and performed quite a few 'magics' which obviously had scientific explanations behind them. Basically, they were all Chemistry experiments. But, performed in a much better and interesting way. We all enjoyed these a lot. Prof Goswami called me a blue thief because I was given a liquid to shake which became blue and as I stopped shaking it turned white! That was one of the most enjoyable class we had. I never expected Chemistry to be so amazing.



## Ishan Vikas 2014 Diaries

The valedictory session started at around 6:00 pm. The program schedule was introduced by Prof Priyankoo Sarmah sir. The speech thanking all the people involved in the program was given by Prof Sumana Dutta mam. The certificates of participation were handed over by the Director of IITG, Prof Gautam Biswas, to the participating girls. The participants had their individual photos clicked.

There was a special dinner at the guest house. We returned back from there and had our last night's sleep (for this tour) in IITG.

My suggestions:

Can be extended to make the program of 10-15 days for better coverage of all aspects.

Should include biology, biotechnology and nanotechnology as a part of the program. (Since the project is to create a scientific temper among the students, so it should include all fields of science.)

Should include a campus tour involving the various buildings, sports complex and everything, besides a visit to the wilderness.

Acknowledgements:

My sincere thanks to the coordinators of this program, Prof Sumana Dutta and Prof Priyankoo Sarmah for their efforts and help whenever we required. They are so good, so friendly, so enthusiastic and very good guides.

My heartiest acknowledgements to Prof Shaligram Tiwari sir who came all the way from IIT Madras to teach us. His way of teaching mathematics is really appreciable.

A very big "THANK YOU ALL" to the PhD sisters who have taken great care of us. They are so friendly and free.



# Tadar Yadar

## Vivekananda Kendra Vidyalaya, Nirjuli

### Arunachal Pradesh

18<sup>th</sup> December, 2014

We started from our respective homes (I, Siddhi, Jyoti and Bhanita) at 5 in the morning. We reached IIT Guwahati at 12:30 pm in the afternoon.

The funny thing that happened that day was that we were lost in the campus. The driver was told the address by several people before, but he was one of his kind. And then due to his forgetfulness we made a total of 2 rounds of the same lake.

This way my experience on my 1<sup>st</sup> day at IIT Guwahati.

19<sup>th</sup> December.

My instinct always says right things to me. So on this fine morning, I felt that I was going to have a tight day ahead and it was true. We started for the inaugural function at 9:50 in the morning, which concluded around 10:30 and then our classes started from 11 in the morning. Never did I feel that even though the things are known to me actually they are not. This was the feeling I had during my first

that even though some concepts are not known to us now, but when it will be taught somewhere down the line, we would have no difficulty in matching with its pace and learning it more clearly. The thing that really touched me was he would always apologize when we could not get the concept. (I mean who ever does that) He felt it was his duty to make us not hate big equations and not be afraid of the big problems. And I do believe he has really fulfilled his duty. We had an amazing class then food and then again Mathematics class. Then we went to mechanical engineering workshop and again there was mathematics class till 6:00 in the evening. We were all fused but he was



not. [I am not going to note down what he taught as there would probably be 13 others to note that down.]

So, this is how the day ended.

On the evening, we had an interaction session with Sumana ma'am and one ma'am [name..... I don't know]. It was fun.

They spoke to us about our plans for career and gave their suggestions too.

21<sup>st</sup> December 2014

There was no class planned for us today. And so, we were taken to the state museum and science center.

First, we started from home at 9.20 in the morning and reached the science center before 10:00. So, after the entry and all, we all went inside the science center, which was so fun. It is a hub of knowledge, all you (means we) have to do is pick it up and paste it in the brain forever. We were given the tour of the whole science center by one sir [name I do not know] who explained us everything right from the 1<sup>st</sup> thing at entrance to the last part. We also had a visit to the planetarium which was quite small and then were shown a 3D movie about dinosaurs and earth [who was quite young at that time]. After the science center we had food in the bus itself and started for the Assam state museum around 1:30 pm. We reached museum at 2:05, where we saw Priyankoo sir who introduced us to one of the former curator of the museum, who was so sweet, enough to take us to the museum tour and explain us about the writings and tools used many centuries back, even though he had to go somewhere at 3:00 pm. He explained us about ancient writings etc. Then we had a tour ourselves. Then we started our way back to IIT and went up to viewpoint which was quite fun and tiresome too.



mathematics class. The class was taken by an amazing Professor of IIT Madras named Shaligram Tiwari. He was full of enthusiasm. He was full energy pack. I personally think he never gets tired. He had some plan already for us as much as possible and clear our doubts. He said us

22<sup>nd</sup> December 2014

We had to wake up early today as we were going to have a campus tour today. We had breakfast a little early and started for our campus tour around 8:00 am. Professor Chandan Mahanta was taking us to the tour who was accompanied by her beautiful daughter, whom she introduced to us as Roina.

He explained to us about the environment and then the lakes and the bacteria in it, the dissolved oxygen and many other things.

We were taken to the place where we could have wonderful over the area. And all those walking actually was worth it. We were also given some information about the Soil Mountains and rocks over here. We returned from the campus tour around 10:20 am. Then again we got ready for our next class which was to be taken by sir, Priyankoo Sarmah. He basically talked about communication skills, like how we should communicate without making others bored and how we can make people comfortable in talking with us by using general language or the way the person can understand. Then we had lunch as usual at around 12:30 and then at 2:15 in the afternoon we headed for the physics lab, where we were 1<sup>st</sup> given a brief account on what we would be taught today by P. K. Padmanabhan and then we were shown all other sirs and maams. We had a good time learning and the best one for me was the experiment related to refraction and reflection of light. So the class ended around 6:00 pm.

20<sup>th</sup> December 2014

The 1<sup>st</sup> activity of the day was mathematics from 9:30 to 12:30.

Then we had lunch at around 12:30 and then were taken to visit EEE department.

1<sup>st</sup> we were taken in the lab of phonetics and phonology and how their work is done.

Then we were introduced to different labs related to electrical, robotics, etc.

Again our mathematics class started from around 4 in the evening which lasted till 5:30. Shaligram sir tried to uncover as much topics as possible.

We had cultural program at around 6 pm after the classes at Bhupen Hazarika auditorium.

23<sup>rd</sup> December 2014

We had a wonderful day today. The day started with us walking into Design Department, where we spoke about our experience during our 5 day stay at hostel. Then after that we went to attend our classes. First we talked about physics at fundamental scale with Subhaditya Bhattacharya then again we were given information about stars, galaxies and cosmology by Sayan Chakrabarti. Then we had lunch break. After the lunch break we visited CIF, which is so wonderful. It is fascinating to see all those big machines working on so small particles. We saw total four of them. Then we had chemagic, which was organized by the ex-professor of Cotton College, Professor Pannalal Goswami. The magic that we saw was amazing. It will make any non-interest people love chemistry, especially organic. After that there was valedictory session, where we were given certificates.

After that we had special dinner at the guest house. I had a splendid time here at IIT Guwahati.

I really hope to come to this place again, but as a student or professor.





# Bhanita Deka

## Vivekananda Kendra Vidyalaya, Nirjuli

### Arunachal Pradesh

18/12/14

Today we arrived at campus of IIT Guwahati. Me along with my 3 other friends came a long way in an Innova for 7 hours. We reached the campus in near about 1:00pm. The campus is so big and wonderful, beyond our imagination. After coming in a short distance we lost our way and made 2 rounds of one of the lakes in the campus and we somehow reached Subansiri girls hostel, our destination. Then our fathers went to meet the coordinators and make the bills. Then me and my friends roam here and there and took many photographs. Then we had our lunch and we were said to meet Sumana mam in the visitor's room. We were given our room keys. We kept our luggage in our respective rooms and went for a nap due to tiredness of such a long journey. Then we went to meet Sumana mam. She was a very sweet lady. Then we went for our dinner and then went for sleep. There Sumana mam briefed us about the next day's program.

Date: 19/12/14

First day of Ishaan Vikash.

In the morning, after doing our daily activities and ready for the day we all, the participants of Ishaan Vikash gathered in the visitor's room and went for breakfast at 8:30 am. After our breakfast we all proceeded to the L-4 lecture hall for the inaugural session. After inaugural session we had mathematics talk by Dr. Shaligram Tiwari sir for near about two hours. His talks were very interesting and also was very nicely understandable. As that was our first mathematics session, he taught us about some basic mathematics and different possible outcomes. He taught us about mode, modulus values, fractions, properties of fractions, functions etc. Then we had a lunch break. After having our lunch and some rest there was the continuation of the mathematics talk. After one hour of mathematics talk we went to Mechanical engineering workshop accompanied by \_\_\_\_\_.

There we saw different kinds of machines used for different purposes like, shaping, grinding, finishing, etc. these machines were manually operated. Also there were machines which were operated by computers. There we saw a laser

cutter too. After coming from there we were very much tired and had no energy to attend our lectures but still Shaligram Tiwari sir had energy to teach us. He was very energetic and enthusiastic. So, we made up our minds to listen to his talks and we did it. At 6 O'clock the session finished and we came to our rooms and freshen up. At 7:30 pm a lady came and interacted with us. After our interaction we went to the dining hall and had our dinner. After our supper Sumana mam briefed us about the next day's program.

Date: 20/12/14

Second day of Ishaan Vikash.

The starting of the day was the same as the previous day. After our breakfast, we went to the same lecture hall and had a session of 3 hours mathematics talk which was the continuation of the previous day. The class was going on smoothly but in the middle of the class we needed to take a 10-15 minutes break as the regional news reporters of Assam came with their cameras and mikes and took interviews of the students, director sir and also Shaligram Tiwari sir. After these all we had tea and once again our mathematics talk started. And so imaginable that during the break also Shaligram sir was arranging the things he wanted to teach next. Then we had our lunch break at 12:30 pm. During the break Sumana mam said that we are having a cultural program that night at Bhupen Hazarika auditorium and there we can do anything we wanted. After having our lunch we, the students of V.K.V.Nirjuli thought of singing a song. So we practiced different songs and chose the one which all of us knew very nicely. Then we came back to lecture hall to attend our mathematics talk for 1 hour. After that we went to EEE department guided by Priyankoo sir and Sumana mam. There we first entered to phonetics and Phonology lab, where we saw computers which captures sounds of different languages to preserve it. Also some PhD scholars explained us about the text-to-speech and speech-to-text technology and explained us how it helped the poor farmers and blinds etc.

Then Sabari Nath mam guided us to Electrical department where we went to robotics lab, mass communication lab, etc. There we saw different robots, AC and DC generators, and transformers. Then we came back to lecture hall for our mathematics talk. We were all tired and had no energy left to study or listen to anybody. But by seeing Tiwari sir's energy and enthusiasm we made up our minds and we did it. By seeing our conditions sir taught only for 1 hour. After the class we had no time to go back to hostel as the cultural program was going to begin. So we went to Bhupen Hazarika auditorium and as we were going to sing a song, we practiced a bit and occupied our seats. For the program an Assamese singer along with his musicians came.

The program began with some songs by Mrs. Biswas and then the Manipuri group and our group presented our songs. After all our presentations the actual singer came to stage and sang his songs. Sumana mam was hosting the program. Then after the program we came back to our rooms, had our dinner.

Date: 21/12/14

Third day of Ishaan Vikash.

We knew that this day was going to be a very busy day. Today we had an early breakfast and left the hostel early. We had a plan to visit the Science museum guided by Sumana mam and Sabari mam and then to Assam state museum guided by Priyankoo sir. When we reached the Science museum the view itself said that it was somewhat related to science. The view was very wonderful. And the things inside were more than wonderful. There we were guided by a guide. There we saw many different interesting things governed by scientific theories. There were different areas for physics, chemistry and biology. Also there was a place of mirror related things. We visited every part of museum and everything was explained by the guide. We also visited the small planetarium and a 3 D theatre was presented in the museum itself. We had a great fun there. Then we had our lunch in the bus and after that we proceeded to Assam state museum. Priyankoo sir was waiting there before our arrival. We had a great time there also as we came to know about the starting of manuscripts, inscriptions, coins etc.

There also we had a guide who explained us about the initiation of these things. We also came to know more about

Assamese culture. Then we came back to IIT campus. Before going to hostel Sumana mam and other PhD scholars took us for a mild walk upto the view point above the hill. There we took some photos, saw the beautiful view from there and came back. After coming back to the rooms we took some rest and afterwards, went for dinner. After having our dinner Sumana mam briefed us about the next day's program and then we went for our sleep.

Date: 22/12/14

Fourth day of Ishaan Vikash.

Today we had an early breakfast as we were going for a campus tour guided by Professor Chandan Mahanta and his daughter also accompanied us as a photographer. Professor Chandan Mahanta was a nature lover and a nice photographer; he explained us more about the nature. After some walk and talks he said to us that he will take us to a place like view point. So we followed him through a small route away from the main road and resulted much adventurous. After reaching to our destination we could see the whole IIT campus. We took some photographs there. Professor Chandan Mahanta taught us how we can make our photographs beautiful and look great. After that we came back to hostel as we were feeling very much unfresh, we bath, changed and went back to lecture hall. There Priyankoo sir talked about communication skills. Not actually that but he talked about "how to write/talk without making the reader/listener bored". He also showed us some videos of TED. He talked more about his own experiences than any lectures. Then we had our lunch break. After the lunch break we went to B-tech lab to see physics through experiments. There Professor Padmakumar Padmanabhan introduced to the experiments that we were going to see. There we were going to see 1 from Mechanics, 2 from Optics and 3 from Magnetism. Professor assigned 6 PhD scholars to explain each of the experiments. After all the experiments were over Sumana mam briefed us about the next day's program as she was not sure of coming to have dinner with us. After some rest at our rooms we went for dinner and went to sleep. The sadness started coming as only one day is left out of these 5 days.

Date: 23/12/14

Fifth (last) day of Ishaan Vikash.

Today is the last day of Ishaan Vikash. We are all sad. Today we can't imagine how these five days came to an end.

At first we were taken to the Design department where we all sat in circle. Sumana mam also joined us. There a sir came and said that going to record our views on these 5 days' camp. Then one by one he asked some common questions and our talks were recorded. After that we came back to lecture hall where Professor Subhaditya Bhattacharya talked on physics at fundamental level. He talked on fundamental particles. Then Professor Sayan Chakrabarti talked on stars, galaxies and cosmology. Also he said us about some of the well-known scientists and their inventions. The talks of both the professors is really going to help us at preset and also in future. Then we had our lunch break. After that we went to Central Instrument Facility (CIF). CIF has total 25 instruments and out of those G. Krishnamoorthy selected 5 instruments to show us that we could understand. But unfortunately we could complete only 4 instruments. But whatever we saw were wonderful and I think those were the ones which we could understand a bit. But then also it was really very wonderful to see big new machines. Then comes the most wonderful part of the day and an important part of these 5 days. It is a

chemagic, a magic show through chemical experiments, by professor Pannalal Goswami. It was really amazing to see chemistry as magic. The magic started from our entry to the class, continued for 2 hours. But these 2 hours were less. It was one of the enjoyable part of these 5 days. As everything comes to an end, we were then in position to conclude our program. There comes the valedictory session. There we were distributes the certificates for attending this program. Priyankoo sir, Sumana mam and Director sir of IIT Guwahati acknowledges all the people related with the Ishaan Vikash program. Then Professor Chandan Mahanta made a slide show of the photos he had and presents it in front of us. We were invited for a special dinner in the Guest house. So we had our dinner there and went for a walk with some of the PhD scholars. Then back in room we packed some things as a preparation to leave tomorrow. When I came here first day my hands were empty. But after these 5 days I am not empty handed.





# Siddhi Shrivastava

Vivekananda Kendra Vidyalaya, Nirjuli

Arunachal Pradesh

18<sup>th</sup> December 2014

Here I am in the campus of IIT Guwahati for Ishaan Vikash. The campus is so beautiful, I wish every school and every college is blessed with a campus like this. I do not really have an idea about what tomorrow will bring with it. I wish it turns out to be nice. It looks grand for sure.

It is such an overwhelming experience to be here at IIT Guwahati. I mean it takes people a lot of hardwork to come here. Today, if any of my friend calls me, I am just going to boast and say: "I am where you want to be".

In the evening, at 8:00, we were called to the guest visiting room to have a short brief session about tomorrow's program. There we met Sumana ma'am for the first time. She is a sweet lady, a very down to earth person. I am sure, the coming 4 days are going to be interesting.

19<sup>th</sup> December 2014

The day started with the inaugural function at the lecture hall. The lecture hall is a big classroom, it is like one of those classrooms that we see in movies. Sitting in the classroom was an overwhelming feeling. In the inaugural session, we saw the director of IIT Guwahati, we met the deans and many more people. It is actually weird to be sitting between so many great brains. After the inaugural session, our first class was mathematics which was taught to us by Professor Shaligram Tiwari, who came all the way from IIT Madras, just to contribute in the Vikash of Ishaan. He taught us about modulus functions, logarithmic functions, etc. It was wonderful being in his class, his enthusiasm for teaching is what makes his classes even more enjoyable. We had a small lunch break at 12:30 and then we went to visit the Mechanical Engineering workshop. There we saw many big machines, which included drilling machine, led machine etc. The

experience was one of its kind. Then we came back to the lecture hall to attend the mathematics class again, after which we retired to our hostel. At 8:00 we had an interaction session again in which we discussed our respective dreams and the available career opportunities. It was a fun day in all!

20<sup>th</sup> December 2014

Today, after coming to the lecture hall, the first thing we had was the mathematics class. Today, we learnt about polynomials, linear inequalities, functions and most importantly graphs. The mathematics class extended upto lunch and then after lunch we had a visit to the EEE lab. The EEE lab was equally fun and fascinating. We visited many departments like Robotics, Electronics, Electrical, Mass Communication etc. We also visited the Phonetics and Phonology lab. I was surprised to know that attention was given to such tiny aspects of life like little acquired pronunciations of words. Priyankoo sir was successful in drawing our attention towards that particular field. The visit to the EEE lab was a long one. We spent sufficient time looking at the robots, and various electronic equipments. We also went to the mass communication lab, where we were taught about the crowd behavior.

In the evening, we had a short cultural show, the program started with Saraswati Vandana by Mrs Biswas and then we got an opportunity to sing a devotional song in group. It was actually scary, but nonetheless it was fun! We also got the opportunity to listen to a renowned Assamese singer. He sang for almost 30-45 minutes. It was a little boring also as I didn't understand the language, but as they say music has no language, but then still it got a little boring.

It was a hectic day, but equally filled with knowledge!



21<sup>st</sup> December 2014

Today we had to wake up early and then get ready for the tour to the museum. At first we had to go to science museum and then the state museum.

The science museum was fun, with so much of science around. The museum had interesting models of chemistry, physics and biology as well. It was a relief to be able to study biology after such a long time. I think science centers are a great way of learning things because there we learn through demonstrations and perfect models. It was an enjoyable trip and I learned that knowledge is infinite. All we need to do is keep our eyes, ears and mind open. We then had a visit to the state museum. This one was a little boring, I will have to admit, but then again I had to keep my eyes, ears and mind open, so that I could receive the knowledge to its fullest. We were very tired by the time the state museum trip got over. When we reached back the IIT campus, we then went for a short walk till the view point and in nature's shade all our tiredness got vanished. The view from the view point was beautiful and serene. I wanted to stay there forever, but then that was not possible and we went back to our hostel and then had rest.

It was a long day!

22<sup>nd</sup> December 2014

It was a long day today. We went for a campus tour this morning. The dean of student's affairs, Professor Chandan Mahanta, who is also a great photographer, took us to a mini adventure and according to me the little adventure was the best part of the camp. Sir taught us so many things related to nature. It is funny how we fail to learn so many things that nature teaches us at every moment of life. It was a fun adventure. We went through a lot of hurdles, the

path was challenging, but the destination was beautiful. We were tired after the tour, but then we got very little time and had to go back to the lecture hall for the communication skills session, actually sir made it clearer that it was about "How to talk or write without making others bored" and that way it sounded better. It was a fun class, mostly about effective communication. After that we had our lunch break and then we went to the physics lab. There we were demonstrated 5 experiments, all on different topics, like, mechanics, optics and magnetics. Optics were my favorite set of experiments. Some things went over the head, but then most of the things were related to our syllabus. So they were helpful too. After the experiments, I got really tired and felt a little sick and so I slept for the rest of the day. Even when I was sick the PhD scholars that were volunteering for this program were very concerned and caring that really touched my heart.

23<sup>rd</sup> December 2014

It was the last day of the camp today. We did not have a tight schedule for today. At first we went to the Design Department where we were asked about our experience and then we went to the lecture hall for a physics class which was taken by Subhaditya sir. We were taught about cosmology, stars and fundamental physics. The lecture was nice. It helped us clear our fundamentals. Then we had lunch break, after which we had chemagic for which all of us were really excited. And really chemagic was nothing but magical. Professor Goswami was probably one of the sweetest person I have ever met. We were shown so many experiments that seemed more like magic than experiments to us. It was actually the most enjoyable 2 hours for me. I wished it extended longer. After that we had the valedictory function, which was the concluding part of the program and I must admit that it was not very pleasing may be because I hate goodbyes, but even every hello has a goodbye. We had a special dinner at the guest house which was literally special. We had great interaction with each other. At the end we stood all united happily with each other laughing and chirping around. The program ended on such a great note.

'Ishaan Vikash'- a wonderful new scheme launched by MHRD, of which we were the first batch and it is such a privilege to be a part of the first batch. It was a wonderful experience. The exposure that was presented to us was great. I never thought I would get a chance to be at the IIT campus at just XI<sup>th</sup> standard. I thank everyone who thought so much about our well-being, who worked so hard so that we could have a comfortable stay here. Everything that I saw here was so larger than life and totally amazing. I wish I get a chance to come back here.

# Jyoti Taku

Vivekananda Kendra Vidyalaya, Nirjuli

Arunachal Pradesh

18<sup>th</sup> December 2014, Thursday Time: 9.00 pm

Finally I am in IIT Guwahati! The campus is huge. Really big and I should not forget to mention “fresh”. There are trees everywhere, lakes, roads are clean, beautiful buildings.

I am in awe of this place and it is not even proper.

Day 1

It nerve wrecking also! A few days ago who would have thought that I will be in the hostel of one of India's most prestigious engineering institutions. I wonder how the day here will go.

Oh! Stupid me, completely forgot the actual topic I wanted to start with.

We (me, Liddhi, Bhsnits, tadar and the \_\_\_ from other NE states) are here for Ishaan Vikash. It is a scheme launched by government (I think) for NE students to give them a bit of more exposure. I think the girls selected are from ‘Udaan’ only.

Our coordinator is Sumana Dutta ma'am. She is a very nice lady. That is all I can say now since I met her only a few moments ago. I mean we should not jump to conclusion about people until we have walked a mile in their shoes. I like to keep a keen observation on everyone – does not matter who. So, I think out of habit I am going to do it here too.

I am excited for tomorrow – what it will bring, how classes are going to be held. I saw only 1% of the campus and I really want to explore more.

I am got to sleep now.

19<sup>th</sup> December 2014, Friday 9:30 pm

Today was great. Absolutely amazing! Mathematics classes were taken by Professor Shaligram Tiwari. He is from IIT Madras and I can comment now that he is an excellent person. He is so patient, understanding and simple. Like he is trying to make us understand mathematics in the simplest way possible.

I admit it: I disconnected with him, a few times and I do not know how he figures it out but apologizes and repeats again. I think it is our faces which are so ‘transparent’- especially mine.

The whole day was mathematics (ok, not whole) which was a little tiring but amazing in a way. Sir is really enthusiastic about teaching and a line he told us really clicked on my mind,

“It does not matter if you understand or not as long as you have a positive desire to receive and learn”.

Ok, I modified it a bit but that is what he meant. I really liked it because it kind of connected to me.

Then after the mathematics class at around 3:30 pm we went to the Mechanical engineering workshop and I went “Oh, my God!”

It was very big and the machines were ....I do not know what to say.

They were nice, new. We saw different machines and the sir told us about their mechanism and applications.

Then again there was mathematics class and then we came back to hostel.

We were accompanied by some PhD didis. They were very friendly and it was like at first sight.

After dinner we came back to hostel and here I am now writing this.

Ok. I got to sleep.

20<sup>th</sup> December, Saturday 2014

Today was another great day! Mathematics class was awesome! It was long and there was still too much to learn! But due to shortage of time it was ramped into long sessions. Sir wanted to cover so many topics and we also wanted to absorb everything. But, time was short.

We covered polynomials, linear inequalities, functions and graphs.

After lunch we went to the EEE lab. We visited many departments like, robotics, mass communication, electronics, electrical etc.

The Phonetics and Phonology lab was amazing. Priyankoo sir guided us and told us about how they are trying to preserve languages which are unknown to the rest of the world and therefore without any attention might get extinct. He also told that they are trying to convert the sounds of machine speakers like human beings, like Stephen Hawking's.

His voice over the machine sounds dull and flat no matter what the emotion is.



So that was their aim- to improve the stuffs and all.

EEE lab was very nice. We saw robots in the labs. One of them was basically a hand or something like that.

So the didi told us what it is about, how it works. The thing was ... that it can operate even if the operator is 1000s of miles away. Like the example she gave us of doctor in USA and a patient in India. The doctor, with the help of that robotic hand can just operate in front of him and the robot would follow signals and work on the patient.

In the evening, we had a short cultural program. The program started with "Saraswati Vandana" by Mrs. Biswas. She had a really nice voice. But the one I loved most was tabla! I just love the way it sounds- strong and solid. Once upon a time, I wanted to be a professional tabla player.

And we got the chance to sing a patriotic song and the stage was nerve-wrecking (for me, I am a scared cat).

Anyway, we sang pretty well, I guess and the Manipuri girls' was so nice with the instruments.

Then a renowned Assamese singer took up the stage and soon we were lost in a sea of music and melody. (Although I did not understand anything it was nice.)

Good night.

21<sup>st</sup> December, Sunday 2014

Oh my God! My whole body is hurting! Today we went to the science and State museum, roamed there whole day and that is why my legs feel like leads.

So we started our journey from here in the morning. Science museum was awesome! And the bhaiya who was guiding us told us many stuffs about the models and it was really fun. Later we went in a planetarium and saw the video of dinosaurs and all disappearing.

I really liked this one. It made me wonder what I can do to keep our earth safe and the lives in it.

Everything happens for good. Maybe if not u\your good, but for a greater Good. Then after lunch we went to the state museum. By the time we reached everyone was tired and bored but because of the sake of remaining I listened intently.

After that we came back to campus and I was really happy that finally I can rest. But, no, there was news.

My feet were hurting so much and now we had to climb up hill. Or rather 'walk'. It was not steep. So the walk was smooth and at last we reached the viewpoint, took group photos. The view point was beautiful and half my pain went away sitting there.

I am feeling sleepy.

22<sup>nd</sup> December, Monday 2014

Today was a really long, tiring day. (I know) I am saying tiring every day. Sorry for that.

We went for a campus tour with the Dean of student's affairs, Professor Chandan Mahanta. Instead of campus tour we went for a mini adventuring.

Actually he wanted to take us through the bushes to somewhere. But the path was too thorny and bushy up ahead.

Then again we went through other route to the same place but his one was safer and longer and steeper! My legs were dying to give up. But I kept moving.

The spot was beautiful and we clicked many photos and sir told us a bit about photography too.

Then we went to the lecture hall and the next session was communication skills session which was to be taken by Priyankoo Sarmah sir.



This was something that nearly made me cry. I was expecting introduction, telling about ourselves, what we liked here and all those stuffs. But it turned out completely different.

And obviously better.

It was more like “How to talk or write in a way that no one is bored”.

I liked this class a lot.

Sir told us 3 important “what to say” points to remember:

Be honest in whatever you say,

Say in a way that even an uneducated person can understand what you are talking about.

Like you know, make it simple.

Say in a way that even the experts cannot challenge you.

So my points have to be strong and simple. After that we had our lunch (doesn't know how, but today's lunch was tastier) and then we went to the Physics lab, where we were demonstrated 5 experiments on different topics like mechanics, optics, magnetics.

Optics part was the best because I could easily understand what the sir was explaining us. The stuff felt real. So I could connect.

Later we came back to hostel and Siddhi was feeling unwell. PhD didis who were the volunteers are really very sweet.

I will try to remember and write their names:

Anju Modi

Rashmi Das

Mahmuda Khannam (not sure)

Gaunangi Gogoi

They were very caring and told us to call them whenever we needed them.

23<sup>rd</sup> December, Tuesday 2014

I am feeling kind of sad. After 5 days of our stay here I do not feel like going back. Ok, I will write emotional part later.

What we did today-

First thing we did was to go to the Design department. There we sat in a semi-circle and shared our experience.

I was about to cry out of nervousness. Seriously, I was so embarrassed at my stage-fear. Everyone is so smart here!

Then we went to the lecture hall and the classes were taken by Subhaditya sir.

Cosmology, star and fundamental physics took up our time and I and half hours went by in the blink of an eye.

Then we had lunch and after that we went to the CIF: Center of Instrument Facility and we were shown very high-tech experience machines.

It was very interesting and the bhaiya tried their best to make us understand.

Then after that there was Chemagic. The Prof is a renowned teacher and he was one of those few people who had inspired Sumana mam to take Chemistry.

Then was the valedictory function. We were given certificates, to each one of us. Then we took snacks and came back to the hall. Mahanta sir had something to show us called the walk. Then it turns out to be the photographs he clicked when we went for our little adventure.

24<sup>th</sup> December, 2014, Time: 2:00pm.

I am really really sorry for my messy handwriting yesterday night. Actually I was really tired by the time we came back and it was already late. So sleep engulfed me soon enough.

Continuing.....

The photos were amazing! Everyone's facial expressions were so funny! All of us present in the hall had 'that' stomach-ache-laugh. It was really good to be there among so many smart and positive people.

Then we had photo session, came back to hostel for fresh up and then we were headed towards the Guest House. For me, it is the most beautiful building in IIT Guwahati. It is so big!

We were there and all of us, participants sat 'together' in a long dining table.

Sumana mam had said in the beginning, “Mingle with each other. By the end of this program I should not be able to distinguish the ‘groups’”.

And there we were laughing and talking together as if we were old friends. Everyone was having a great time. We exchanged phone numbers, added each other on Facebook, took pictures and in the middle of all these a bitter sweet pain arose.

I was seeing we had not opened up since the starting. I wish we had more time to get to know each other.

Dinner was awesome.

And while returning we came with the didis. They were so friendly. It was really great to talk to them.

Then we went upstairs to the Manipuri girls’ room and we talked talked talked.

(We are girls after all).

And then we went to sleep.

So... about today... Manipuri girls and Assamese girls left. It was very sad to see them go. There is Assam bandh today. So, we could not go, but hopefully by tomorrow we will be back in our homes.

This program was somewhat different.... I can conclude that. The people are so friendly. They are people of very high

posts. I am nervous. The environment, too. Everything is so welcoming that I am not feeling that sadness anymore that it is Christmas evening and I am not home.

I will really miss everyone here: Sumana mam, Priyankoo sir, PhD didis, the participants and the calm atmosphere here.

I am really going to miss IIT Guwahati and I am thankful to Ishaan Vikash and all the people who participated for making me realize so many things. Life is full of opportunities and there is so so so much more to do.

Sumana mam’s words this morning were really heart touching. She said: “You will not get memories by engrossing yourself in the digital world like the phone, laptop, tabs etc. But you will get plenty when you will interact with more and more people. A smile is all it takes to make someone happy. That is why keep smiling. Be happy and make others happy!”

So, after several years down the lane, I can confidently say like, “Ishaan Vikash? Oh, that program! We were the first batch to attend it. I have got some great photos of the camp and some great memories too.”

THANK YOU.





# Shweta Chetry

Tezpur Gurukul, Tezpur

Assam

19<sup>th</sup> December 2014

It was the first day of our free day academic interaction. We had our morning breakfast at 8:00 a.m. in the mess our Subansiri hostel and proceeded towards the lecture hall. There we had the inauguration session. In the inauguration session we were introduced with the faculty members and all those who were part of Ishan Vikas Programme. Then after this we had again our breakfast and again went to the lecture hall for math talk which was given by Professor Shaligram Tiwari, who was a faculty member of IIT-Madras. He on the first day taught us about the use of modulus, fraction that is proper, improper step functions, logarithm etc. He taught us the basic concepts clearly, cleared our doubts and hence gave us a clear idea of the concepts. After the math talk we had our lunch. Again after our lunch we had the math class. Then at 3:30 p.m. we went to visit the mechanical workshop where we saw different types of machines like lead machine, power saw, shearing machine etc. They also explained us how these machines work and gave us an idea on machines. After coming from

mechanical workshop we again had our math classes. At 5:30 p.m. our classes were over and we had the student's interaction in the visitor's room of our hostel. And then we had dinner at 8:00 p.m. and after that we went to sleep.

20<sup>th</sup> December 2014

This was the second day of our stay at IIT Guwahati. We had our breakfast at 8:30 a.m. and proceeded towards the lecture hall. There we had our math classes from 9:30 a.m. to 12:30 p.m. Then we had our lunch and went to different labs specially the electrical engineering labs where we saw different experiments. They explained us, solve our queries and doubts. We also came to know about their applications and uses. Then after that we again had our math classes till 5:30 p.m. In the whole day math class we were taught polynomials, theorems, inequalities and graphical representations and algebra. Our Sir solved our queries and gave us examples to solve and hence gave us the complete idea on the above topics. After our math classes we were taken at Bhupen Hazarika auditorium where a cultural programme was organized. Our tiredness was gone when we heard different songs and saw the programme. We enjoyed a lot and came to hostel took dinner and slept.

21<sup>st</sup> December 2014

Today this is the third day of our stay at IIT Guwahati. Since it was a Sunday we had no classes but only visits to state museum and science museum. At 8:00 a.m. we had our breakfast and we were taken to the science museum first. There we saw

many things which cleared our concepts on different topics of Physics, Chemistry and Biology. Also we saw planetarium which gave us an idea of the stars, moon formation, extinction of dinosaurs etc. We also saw the 3D show and were greatly fascinated. We then had our lunch and went to state museum. There we saw and came to know about life's of ancient people, their works, lifestyle, different cultures etc. After this we returned back to IIT Guwahati. Then again we went to a view point to click pictures; we enjoyed, had fun and came back, had dinner and slept.

22<sup>nd</sup> December 2014

It was the fourth day of our stay at IIT Guwahati. We had our breakfast at 8:30 a.m. and went for campus tour. Chandan Mahanta Sir and his daughter accompanied us. He taught us about dissolved oxygen balance in water etc. He took us to a hill and we did hill climbing.

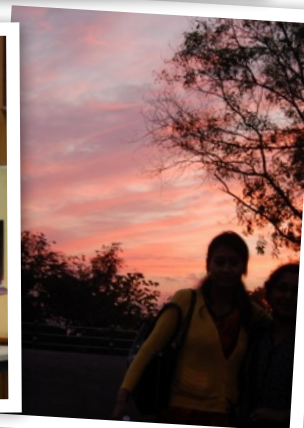


He also taught about the mountains and its composition and the minerals found. In the hill climbing we came across many plants and trees. In fact we were truly amidst nature. Then again we went to another hill and when we went there we could see entire IIT Guwahati. We clicked pictures and enjoyed the adventurous trip. After this tour we went to the lecture hall and had our communication skill classes where we were taught how to talk in an effective way. We learnt that communication actually means connection with people. After these classes we had our lunch and headed towards the B.Tech lab for physics experiments. There we were explained first and we were taught 6 experiments regarding various topics in physics. We understood the theory as well as experiments very well. After this we had students' interaction and then after dinner we slept.

23<sup>rd</sup> December 2014

This is the fifth day of our stay in IIT Guwahati. So it is a sad day. Actually we had our breakfast at 8:30 a.m. and then

went to Design building and there we were asked about our experience and so on. Then from 9:30 a.m. to 12:30 p.m. we had physics classes where we were taught about fundamental particles, stars, galaxies and cosmology and not only that, the professors also solved our queries. Then we had our lunch and we went to Center for Instrumentation Facilities where we saw different machines which we do not see every day because all were above 50 lakhs. We also came to know about their applications and principles and our queries and doubts were also solved. Then from 4:30 p.m. to 6:30 p.m. we had chemagic which was very much interesting and full of fun. Actually we learnt it in such a way that we will never forget. After that we had valedictory session where we were given certificates. And after that we had our dinner at the guest house where we enjoyed a lot and came back to hostel and slept.



# Suhana Yasmin Mazumdar

Jawahar Navodaya Vidyalaya, Hailakandi

Assam

## Suhana Yasmin Mazumdar

First of all I would like to thank Ishan Vikas. It is an initiative by the Ministry of Human Resources Development for some of the selected students of North Eastern States to undergo one week academic Interaction at IIT Guwahati.

I arrived at the IIT on 19<sup>th</sup> December early morning. I am staying at Subansiri Girls Hostel with my mother. I am overwhelmed to stay inside the campus of IIT Guwahati. It is a wonderful experience to be here and to live a life like other students at IIT. Everywhere I can find the overflow of knowledge. The only thing we need to do is to understand all those things and utilize it in our day to day life. We take our food in the mess and the food served is really good. We are on a five day program from 19<sup>th</sup> to 24<sup>th</sup> December

On the first day that is on 19<sup>th</sup> we had our breakfast at 8:00 a.m. upto 8:30 a.m. and then we proceeded towards the inaugural session up to 10:30 a.m. From 11:30 a.m. onwards we were taught Mathematics by Professor Shaligram Tiwari from IIT Madras. He taught some of the topics and made our concepts clear regarding that. We had our lunch thereafter from 12:30 p.m. to 2:30 p.m. After that we again had the math class taken by Sir Shaligram Tiwari. When this was over we were taken to the workshop under the Mechanical Engineering department at around 3:30 p.m. And we were demonstrated the led machines, shaper machines, welding machines, laser and many other machines. We enjoyed a lot watching all these things then we came back and had a math class from 4:30 to 5:30 p.m. at the lecture hall. After that we moved to the hostel. We were guided by some research scholars. After the dinner we had interaction with each other at the visitor's room.

On 20<sup>th</sup> morning we had breakfast at 8:30 a.m. and after that we moved towards the lecture hall and had classes on math from 9:30 a.m. to 12:30 noon, then we had lunch break. The lunch break contained delicious food items and we relished on that. After that we had some time to get to our math class restarted. So we decided to refresh ourselves by walking around the campus. The scenery here is truly mesmerizing. We took the photographs of all around especially the lakes and the migratory birds there. Then we again went to attend the math class and from there we went to Electrical Engineering department at around 3:30 p.m.





Later we went to different departments like phonetics and phonology where we saw that how two languages vary from each other. Then we saw an extremely important thing where they have made a technology where without looking a person we can understand what he is reading like a blind person. They made the system by some coding and assembling all the sounds which pronounce the same and by moving the cursor they can understand. Next we moved to see some useful machines like the robots. There were two robots which detect one another through special sensors and pass their data through wi-fi network and they are useful in disaster management. We also saw two robotic arms. They are quite similar to the human arms. By the computer programming we can give some commands then the arms start moving. Actually these are small motor called servo motors. We also went to the multimedia lab and also the electrical lab where there were many resistors, capacitors, circuit, windmill, and transformers. After visiting all these places we again went to attend the math class. After 5:30 p.m. they have organized a cultural program which was held at the Bhupen Hazarika auditorium. The programme started with a Saraswati Bandana followed by a religious song and a Nepali song finally there were songs sung by a famous singer. He sung his self composed songs and the song of Dr. Bhupen Hazarika. We enjoyed the programme very much.

On 21<sup>st</sup> morning, as usual we had our breakfast at 8:00 a.m. and since it was Sunday so Madam Sumana Dutta and Sabari Nath took us out to see the Science Museum. In the science museum we were lost into the world of science. Actually the thing which proved to be beneficial was the person who explained us about the things around, the actual concept behind each and every instrument kept over there. We also saw the planetarium; inside it we saw the cosmic collisions. We went to see the dinosaurs inside the park and also the aquarium so beautiful fishes of different varieties like the Piranha, gold fish, sharks etc. we were in the science center till 12:30 p.m. After that we went to the Assam state museum at around 2:30 p.m. where the curator of the museum Mr. Shamiron Baruah showed us of the ancient scripts and the inscriptions on the stones of the early 18<sup>th</sup> century. He told us of the Indus Valley civilization. He also told us about how people started writing and where did it start. The main thing he said was that we should not forget our culture. The whole museum consisted of our culture and tribes, especially the people of Assam how the live, their dresses, their life styles, their tools etc. We came back at 5:30 p.m. and got back to hostel at around 7:30 p.m. Later we had our dinner at 8:30 p.m. and retired to our own respective rooms. The campus of IIT Guwahati is very calm and quite which fascinated me a great deal. I just love being in a place like this. The students here use bicycles to travel from one place to another especially to attend their classes. It's in a way good for their physical fitness and is also environment friendly and it also looks nice.

The next day that is on 22<sup>nd</sup> December we took our breakfast at 8:30 a.m. At 9:30 a.m. we were taken to a campus tour by Sir Chandan Mahanta. He made us understand the chemistry as well as the Biology behind every naturally occurring thing. For example, in the lakes, if the dissolved oxygen level goes down then the BoD level goes up and vice versa. This causes a great loss to the water bodies. He took us to the hill top and from there we could see the whole campus very distinctly. There were some places which were really good for photography. We also passed through the dense grasses and bushes which seemed quite adventurous. Sir also showed us the composition of the soil, like the mica, quartz and all are present in the soil. He also told us about how the soil was formed there etc. We came back from the campus tour by 10:30 a.m. Then we came to the hostels and got freshen up by 15 minutes and again went for another session which was in the lecture hall itself. Later the lecture on communication skills was given by Dr. Priyankoo Sarmah. He told us how to talk or write in a way that no one is bored. He shared his personal experience and he has learnt from his friends. One of the points included was that we must be honest in whatever we say and we must say in such ways that even an uneducated person may be able to understand. We must bring it to their level of understanding and explain. He gave a powerpoint presentation and his slides covered some of the topics like how to organize



what we are going to read or write. He also showed us some of the video clips from TED.com which included the speech given by Pranav Mistry. He tried to make us understand his ideas to digitize the material world in a very simple manner without using and technical terms. It was quite interesting watching and listening to it. He also told about languages. We learn languages at small ages because we acquire it. We can just do it to minimize error in our language. After that we had a lunch break from 12:30 to 2:30 p.m. Then we went to visit the physics lab under the department of Physics. There we were welcomed by Dr. P.K. Padmanabhan and some of the research scholars. They demonstrated some experiments like measuring the velocity of light when it passes from one medium to another using spectrogram, finding the moment of Inertia of a flywheel. There were six experiments and it fun doing all these experiments. These were simple experiments but many concepts got cleared while performing these we saw many instruments which we didn't see earlier. Physics is my favorite subject and I love doing anything which includes physics behind it. After doing all these experiments now I became more interested in learning physics. We came back from the Physics lab at about 6:00 p.m. after completely doing all the six experiments. We came to the lecture hall and took photographs together and also an interaction. After this we went back to hostels and had our dinner at 8:30 p.m. Every night after dinner we used to have an interaction among the teachers and the students in the visitor's room. This will remain most memorable

to me. I had a wonderful time during my stay at IIT Guwahati. It's like a dream come true. I never imagined being in such an institution one day. But now I can say that I am much fortunate I could stay here for one week at least. I will miss the place very much. I would extend my heartfelt thanks to the coordinator of Ishan Vikas and especially Madam Sumana Dutt and Sir Priyankoo Sarmah without whom this programme would not have been a great success. Thank you once again for giving such a marvelous opportunity.

On 23<sup>rd</sup> that is today as usual we had our breakfast at 8:30 a.m. and inside the academic complex we were asked to share our personal experiences inside the campus and what we will recommend to our friends and teachers after going. They captured these all in the camera. After this was over we came back to the lecture hall where we were given some basic concepts of physics at macroscopic and microscopic level. We got much new information about new discoveries which are going on. It was fun to get to know many things. The classes were taken by Subhdiya Bhattacharya who said about the fundamental particles and the Higgs particles and by Sayan Chakrabarti who told us about the stars, galaxies etc. He also told us about the geometric and heliocentric model of the earths. Actually Physics attracts my mind so much that I will be happy learning anything regarding that anytime. The slides prepared by them contained valuable information and pictures of many famous scientists. I enjoyed a lot.



I Remi Moirangthem along with five students of Kendriya Vidyalaya Lamphelpat No. 1 and one student of Comprehensive concept school came to IIT Guwahati to join the program for Ishan Vikas scheme. While coming from Guwahati airport to IIT Guwahati campus, I felt pain on my back because of long distance, but when we entered the campus, the pain and the exhaustiveness had disappeared. I had never seen such a huge campus and it also felt so naturalistic. The program was only for five days and it started on 19<sup>th</sup> December 2014. I was really a good program and I really appreciate the dedicative works of Ma'am Sumana Dutta. She really arranged the program in a short duration in a way that no one could ever complain or point a finger on it. I am really thankful to Ma'am Sumana Dutta and researchers for their care and guidance to the students. Actually I would thank the program coordinator for organizing such a beneficial, adventurous program for the students and thanks to the experts as well as research scholars for their guidance and help.

The most interesting parts of the program included inauguration, interaction, math talks, visit to Mechanical Engineering, EEE department, Physics lab, communication skills, Museum and even campus tour etc. which altogether improved the learning process.

The way sir Shaligram Tiwari taught or shared the ideas of Math, it rooted off the doubts that dump into my mind. It was really interesting and I am thankful for giving such a valuable knowledge in a short period of time to the students.

Everything we learned through interaction was new, full of knowledge, interesting and also adventurous. For me it was a great opportunity to interact with experts and learn new things. The way expert Priyankoo Sarmah presented on communication skills was actually fantastic. It really strikes my mind as he told about how to present in a way as to make the people listen.

We walked up in the hill areas that were full of different kinds of vegetation, watching the beauty of nature and taking photographs with expert Chandan Mahanta. His explanation

increased my knowledge of how physics, chemistry are related to our lives.

All the programs are very attractive and enlightened the knowledge of students. We also got the chance to see the historical objects of Assam at the state museum and also gained scientific knowledge at the science Museum.

Thanks to Ma'am Sumana Dutta for her organization with well prepared programs in a short duration with different fascinating educative program and to researchers for their guidance and care. Ma'am Sumana Dutta always cared for us asking for every meal every day. Ma'am Sumana you are so friendly, caring, and also a great person. I love to interact with you. You are so simple and I like your ever smiling face. There were amazing classes and I want to keep in touch with

Ma'am Sumana Dutta as she is the coordinator. I actually want to request Ma'am to choose me as a scout teacher or guide for the future program. I also request her to send me a video copy of the program so that I can share that with our students and respected Principal.

I myself being a teacher gained lot of knowledge about how to expose our mind to the world. Besides theoretical knowledge I was able to share the practical knowledge as well. I really found all the members of each department very

helpful, friendly and with no pride that

is a good symbol of what they are. From this program I got lots of knowledge that are valuable to my designation. Such programs and experts inspire me to conduct research in my subject. I am really thankful to respected Principal Sir for sending me here with the students and I wish to go or participate more often in such kind of programs. If I get the chance I surely will come here again and I wish to choose myself as the guide for the students.

The most interesting parts of the program included inauguration, interaction, math talks, visit to Mechanical Engineering, EEE department, Physics lab, communication skills, Museum and even campus tour etc. which altogether improved the learning process.



We would like to extend or organize another program under Ishan Vikas as soon as possible for about 10 or 20 days so that the students can easily understand more about IIT Guwahati and more have more interactive classes since we cannot learn many things in a day. I am also very eager to take part again in the next program. I realized that due to the short duration some students got difficulty to understand the programme as they did not have enough time to tackle their problems.

As my suggestion I would like to add that more programs like Biology, Biotechnology, and creative subject should be included with practical. And the number of days should be 10 to 20 days

### Last day of Ishan Vikas

On 23<sup>rd</sup> December after having breakfast we went to the physics department and there was another interacting program. It was sharing of thoughts about the Ishan Vikas scheme like the things to be included, and about its importance for participating etc. It is always good to give feedback and share comments and feelings upon a program. After that I too participated with the students in the physics class that was so exciting to hear. The lecture was about fundamental

physics given by Subhaditya Bhattacharya followed by Sayan Chakrabarti. Later after lunch we visited the CIF. There we saw many expensive instruments like ESM, FESM. I got the idea that very small organisms which are beyond 0.2 cm and are unable to see in compound microscope can be seen through FESM etc. However, the most interesting part of the day was Chemagic. We knew that it was due to some chemical reaction but the way presented by Professor Pannalal Goswami was so fantastic and interesting. I could never forget such a program in my life. Being last day of the Program, the organisers arranged a special dinner for us in the guest house. It was nice and really enjoyable. I really hoped at that hour that the program proceeded further for all the students.

We have to leave IIT G by 9:00 a.m. But I do not feel like leaving the campus. I will miss the campus, the experts very much. The program was conducted successfully and it was really interesting. It made the students to think of higher studies. I once again thank Ishan Vikas coordinators, city coordinators, expert, research scholars for their hard work and guidance to the students. I really appreciate it!



# Nira Devi

## Kendriya Vidyalaya, Lamphelpat, Manipur

### Introduction

Hi, I am Chingangbam Nira from Manipur. I am a 11<sup>th</sup> standard student of Kendria Vidyalaya Lamphelpat, Imphal West, Manipur. I have come here for Ishaan Vikash scheme. It's not my first time in Guwahati, but it's my first time in IIT Guwahati. We have reached IIT on the night of 18<sup>th</sup> December, 2014. We were given our separate rooms in Subansiri Hostel.

IIT campus is one of the biggest campuses I have ever seen in my life till now. So I was quite amazed at first.

According to me this place is a combination of nature and development. And I think sustainable development is strictly followed here.

At first, I thought that IIT is only for engineering students. But after coming here I got to know that it's not only for engineers, it's also for other students of different subjects. So, this is my brief introduction.

19<sup>th</sup> December, 2014

### First day of Ishaan Vikash

We all got up early, brushed our teeth and then took a bath. Then took breakfast, then went to lecture hall. Sumana mam guided us to the lecture hall. It's not so far from the hostel, it's only a few meters away from the hostel. The view of the campus in the way to lecture hall was quite impressive. Everything was so neat and clean. Roads and rivers are very clean and everywhere there is all green and green. With the cool breeze from the trees and green scene all around, it makes our walk very pleasant and cool.

Then we had an inaugural function. Director sir and some other respected, well known professors gave their speech. It only lasted for 1-2 hours. After that we have our mathematics class by Sir Shaligram Tiwari who is a very well-known person. His teaching is very great. He taught us how to handle common mistakes in simple things. He taught very calmly with a smile and he always gave a

simple example for every problem to make us understand carefully. He gave problems to solve after every lesson. He taught that it makes us the concept about the things very clear.

And one thing I very much liked about him is that he is very active. He is always ready to teach anytime and I have never seen any person so energetic in my whole life.

After the class we had lunch and went to Mechanical workshop. So it was quite new experience for me. We saw lots of tools which are used in industries and got to know how they work and what are their uses.

After that we came back and again have mathematics class and after that we returned back to the hostel.

20<sup>th</sup> December, 2014

### 2<sup>nd</sup> day of Ishaan Vikash

We have mathematics class, then we went to Phonetics and Phonology lab. Sir Priyankoo Sarmah guided us. It is of great fun to go with sir, since he made us laugh a lot and he has his own way of communicating with people, which really impressed me.

After that we went to EEE lab, robotics lab, Multimedia analytical lab, and etc.

After returning we again have our mathematics class. Then after that we went to auditorium (Bhupen Hazarika auditorium).

And a very memorable part of this trip is our group song representation at the auditorium. It so happened so quickly that we don't have time for practicing. But still fortunately it turns out well in our amazement. I will never forget this day.

21<sup>st</sup> December, 2014

3<sup>rd</sup> day of Ishaan Vikash

We went to two places – one is science center and state museum of Assam.

We woke up very early and we travelled by bus. It is our first outing since we came here. At the science center we got to see many new things made by science. We got so many ideas and knowledge from it like the 3D animation videos, how earth was formed, how dinosaurs got extinct from earth, how our image are on the florescence sheet even after we are not in front of it, how mirrors give different images etc.

And we had lunch in bus in our way to the state museum, Guwahati.

There at the state museum, we got to see different types of manuscripts and coins and it also display the culture of Assamese. One sir guided us and told us about the things which makes our trip easier.

After that we came back to the campus and climbed a very beautiful hill. It's quite an experience. We laughed a lot. We joke a lot. We had quite fun. After that we returned to our hostel, had interactions and then dinner.

22<sup>nd</sup> December, 2014

4<sup>th</sup> day of Ishaan Vikash

We had a very great day today. One of the sir of IIT took us all for a campus tour. He explained many things on the way. He explained about how the rocks are transformed into soil, what they contain and how we can conserve our nature, how we can save birds. We also went through a very difficult way which is full of thorny bushes and steep road. At first I was quite afraid that wild animals may come in the way after some time. I started liking it very much. It's full of adventure. We had a lot of fun.

After that we went to Physics department and some sirs explained us about some experiments which is very valuable for us as we don't get much facilities in our own school, like this and we also got to see many instruments by our own eyes.

After that we had a brief photo session with all our friends.

In between the tour to Physics lab and campus tour we also had a class by sir Priyankoo Sarmah in a very interesting topic "How to talk so that no one gets bored". I have never thought there are people who discuss about such things.

Above all, my visit to IIT has been quite a memorable days and it will remain as very precious moments of my life till I die. Thanks to IIT for organizing Ishaan Vikash. Thanks to all the professors and IIT students for their coordination. They are all kind and friendly which makes us easier to approach to them anytime. I have lots of fun here. I will never forget these days in IIT. I am very lucky to be one of the students selected for Ishaan Vikash. I got a golden opportunity. Hope Ishaan Vikash becomes a very successful scheme in India and even in whole over the world.

Thanks for everything!!!

23<sup>rd</sup> December, 2014

Today is the last day of Ishaan Vikash. So I am very sad whenever I think that I am going back tomorrow. It's a very short period of time. I really wanted it to extend for more days.

Today we went to Design department and had an interview. We all spoke about our own experiences which is the best part of the program because we got a chance to express ourselves, what we feel, what we like, what we don't like.

After that we came back to lecture hall and had our physics class by two different professors. I liked their teaching style very much as they show everything what they taught in power point presentation.

Then we had a short lunch and after that we went to CIF lab and some sir showed us many new instruments which are used in industries, mining, hospitals, etc. they spoke brief things about it. But one thing I am very sad is that I couldn't see all the five instruments which was supposed to be shown because of limited time.

Then came the most amazing part of Ishaan Vikash, that is the 'Chemagic'. We had a lots of lots of fun here. One very talented and well learnt professor, I can't recall the name, shows us the magic of chemistry in a very enjoyable way. After the program, he also taught us what actually happen, what he is using. From this we got lots of knowledge plus lots of fun.

Then we had a short closing function; certificates were distributed to every student and Sumana ma'am took photographs for all of us.

Then we went to guest house and we all had dinner together for the last time.



Thank

You