

**KUMARI ARIVIAL PRAVAI**

**YOUNG SCIENTISTS PROGRAMME 2013-2014**

## **Scientific Awareness Camp**

**9&10, November, 2013**

**PSN Group of Institutions, Thirunelvely**

Report by

**Steffy,**

**Leader, Red Team**

**Day: 1**

**Venue: Science Centre, Thirunelveli**

**Date: 9/11/13**

We started our exciting journey for the scientific camp around 6:45 am from Thasaiah Mandapam in Marthandam. Some students got in the bus from Nagercoil too. Then we stopped near a church in Punniavaalanpuram to have our breakfast at 8:30 am. Then we travelled for nearly two hours and reached the science centre at 10:00 am.

First, we saw the science park. It was well maintained. We saw the outlook of a digital planetarium. It had many pictures scientists and inventions. Then we entered the auditorium. Our team co-ordinators, guides and our consultants also accompanied us to the hall. There was a surprise waiting for us. Yes, Masha Nazeem who is a great young scientist was also present there. The meeting started sharply at 10:25 am. Varsha did the master of ceremony. The dignitaries present were Mr.M.Velaian organiser of KAP, Ms. Masha Nazeem young scientific innovator Shri..Lenin Scientist Science Centre, and Er. Ingersol.Scientist ISRO Mahendragiri.



Shri.M.Velaian gave Introductory address and welcomed all. Then Ms.Masha was welcomed to show her PowerPoint presentation. She said that she was happy to see all of us seated over there. She said that she was not a person

born with a silver spoon and that she had danced Bharatanatyam in her childhood. She did her first project when she was just seven years old. Her first project was the Hi-Tech Toilet. She got that idea when she was going through the newspaper. So, she got a golden opportunity to meet Dr.A.P.J. Abdul Kalam. Her first project was also shown for the first time in the television. She got chance to speak in the World Toilet Summit 2007. She mentioned that the two keys to success are patience and perseverance.

She also explained about another project called the flameless seal maker. Lat is melted and used to affix seals in it. She also got ignite-award for 2009 and that was the fifth time, she met Dr. Kalam. She was also a KVPY scholar.

When Ms.Masha travelled to Japan, she felt uneasy to carry her belongings. This made her to design a mechanical porter. She got Ignite award and met Dr.Kalam for the sixth time. She also got president's biennial award.

She demonstrated her model with Former President of India Smt. Prathiba Patel. She stressed that she had met five chief ministers and three governors only due to her deep interest in co-curricular activities. Her advices were inspiring.

At the middle of her PowerPoint Presentation, she brought up; Master Gautam demonstrated his project which was guided by Miss. Masha Nazeem. Her golden words were "all the rigid rules are flexible if we have talents". Then her father, Mr. Nazeem gave a short speech. He spoke that we did not go to any competitions but co-curriculum events drove us to National and International Competitions. He said that parents are the inspirational for their children.



Then I gave a feedback on Miss.Masha's speech. Then Shri. Ingersol gave a short speech. He congratulated Ms.Masha for her achievements. He also said sharply that Masha is a born fighter. Then Mr. Lenin gave a talk. He said that KAP's aim is to inculcate Basic Science in the students. We must try everything application-oriented. We should create a situation for learning. He also told that chances favour the preparation.

Then we went through the science centre. We saw many banners that contained pictures of science centres, history of the science centre, etc. We saw a museum too. Then we entered a room, fun science. It had many experiments like:

- Square wheels.
- Shake hands with yourself.
- Hotspot.
- Air cannon.
- Music in air.
- Order and chaos.
- Lazy coins.
- Inertia ball.

Then we saw some banners on Higgs-Boson. We saw the pictures of large Hadron Collider. We also saw the picture of Peter Higgs. We also understood that Higgs-Boson is a hypothetical massive elementary particle predicted to exist by the standard model of particle physics. There was also a piece of news from The Hindu edition, July 3, 2012. It read: Footprint of 'God particle' found. There were more interesting facts on Higgs-Boson. Edwin Sam sir explained about them clearly.

Then we entered a room, 3D theatre. It had more experiments like:

- Anamorphoses
- Jumping Disc
- Magic tap
- Planetary motion
- Curie point
- Floating magnet
- Magnetic lines of forces
- Illusion with rings
- Centrifugal force
- TV sphere
- Audio bucket

Then we climbed the steps. On the way, there was a simple camera and all of us enjoyed, having a look at it. Then we entered a room, electronics. At the entrance, we saw two infinity mirrors. As we entered inside we saw posters on:

- Moving electrons(By J. J. Thompson)
- Nano electronics
- Conductors, insulators, semiconductors
- Electronics components(resistors, silicon chips, transistors)
- Conduction band
- Diode transistors
- Integrated circuits

- Modulation
- Wireless technology
- Bluetooth
- Sensors

We also had a glance at a video on chip manufacturing process. Then we again entered the auditorium. At the entrance, I saw a Thirukural .

We entered the hall and sat according to our teams. There, we saw Mr. Lenin. He said that he was going to show some small demonstrations. He said us that we have to love science. We love story books like Ananda Vikadan because we have interest in it. So, if we do science experiments, it would be more fascinating.

His demonstrations were:

- There was a plain paper in a board. Lenin sir sprayed a liquid on the paper and the words: "welcome to science centre" were seen in pink colour. After some time, the paper became blank again.
- There was a liquid in a flask. When it was shaken, it changed from light yellow to blue colour.
- A strong and a weak student were said to come over the stage. Each was given a vertical piece of news paper. Who tore the paper into two vertical halves, was considered as the winner. The boy, who was considered weak, tore correctly. We were surprised by that.
- A plate was filled with bits of paper. When a liquid was poured, the papers caught fire.
- Two cups were filled with coca cola drink and a straw was kept. Praison from Maroon team and Ethazl from Red team came forward to drink it. Who would drink the juice using straw first, was to be regarded as winner. Everyone said that Praison would win. But, he was not able to drink even a drop while Ethazl drank it fast. We were indeed astonished.
- A book was kept with a paper over it. When we put them together they fell together instead of flying separately.
- A mica sheet was kept on a paper on a table. Only one end of the mica sheet was projected out. When it was beaten, the projected side exactly broke.

He also gave reasons:

- First experiment:  
With phenaphtaline which was colourless, the letters were written on the paper. It was invisible. Then, ammonia was sprayed over the paper. So, the letters turned pink.
- Second experiment:  
The liquid in the flask was  $\text{Na}(\text{OH})_2$ . When we shake, Oxygen gets oxidised and changes to blue.
- Third experiment:  
In the papers, fabric was pasted vertically and horizontally.
- Fourth experiment:  
Inside the papers, there was potassium permanganate. The liquid poured was glycerine.
- Fifth experiment: In Praison's straw holes were put. So, the atmospheric pressure entered the hole and the liquid did not come out.
- Sixth experiment:  
Due to the atmospheric pressure, the book and the paper fell together.
- Seventh experiment:  
The mica sheet broke due to inertia.

Then, Achsah of green team came on to the stage and explained the experiments demonstrated by Mr. Lenin. She also said that: If we learn Fundamental Science, it will be enjoyable.

Then Ingersol sir suggested that the mica sheet which was projected broke, not due to inertia, but due to the atmospheric pressure.

Then, Meera of blue team gave the vote of thanks. Next, we had our lunch.

We started to go for a field visit around the science centre. We saw many plants and trees. We went along with our team mates.

We saw variable pendulum, compound pendulum, pre-historic park, swing, seesaws, other games and echo tube. We had a good time playing in swings and seesaws. We also enjoyed making sounds through the echo tube.

Then we saw the statues of some great personalities. They are

- Birbal Sahni - Birth - Nov 14, 1891  
Death - Apr 10, 1949
- M.N.Saha - Birth - Oct 06, 1893  
Death - Feb 16, 1956
- S.N.Bose - Birth - Jan 1, 1894  
Death - Feb 4, 1974
- Homi. J.Baba - Birth - Oct 30, 1909  
Death - Jan 24, 1966

- Vikram Sarabai - Birth - Aug 12, 1919  
Death - Dec 31, 1971
- J.C.Bose - Birth - Nov 30, 1858  
Death - Nov 23, 1937
- S.Ramanujan - Birth - Dec 22, 1887  
Death - Apr 26, 1920
- C.V.Raman - Birth - Nov 7, 1888  
Death - Nov 11, 1970

**Venue: PSN college of Engineering, Thirunelveli**

**Date: 9-11-13**



Then we got into our bus, and travelled as we finally reached PSN College of engineering, Thirunelveli. Mr. Ramesh Associate professor arranged the function. I did the master of ceremony. First, Shri Mullanchery M.Velaian Organiser of KAP welcomed the gathering. Then Dr. V. Sathasivan, Principal PSN College of engineering, advised the young scientists to perform well. Capt. Bennet Singh advised us that we have to do something creative for the next generation. Next Dr. James Wilson Chairman Sigma College of architecture advised us to take notes. He also said: You can make points on whatever you see.

Next, Er.Ingersol Scientists ISRO Mahendragiri gave power point presentation. The topic was 'Nurture Nature', which is our theme talk.

He explained about ecosystem and their importance. He said: "dynamic complex of plants, animals, microbes and other physical environmental features together constitute an ecosystem. The ecosystem services affect us in local, regional as well as global level. Ecosystem degradation is a great concern for humanity. All of us are far away from nature. There is economic invisibility of nature, that is, nature is present, but it is, economically invisible. When we see an assessment on ecosystem, than growth, decline is more. Ecosystem growth is needed for a balanced approach. Forest wealth is an important factor. But, source of timber is renewable, but potentially depletable.



Wetlands are the areas where water table is at or near the surface level, or the land is covered by shallow water. It has more uses. But it is now being converted into commercial properties." Then we had a short tea break.

Then Velaian sir did a power point presentation on **space era**. The interesting thing was that it was typed in Tamil. He explained that: "After 1957, it was found that earth is round like a Goa fruit. In 1799, Tip sultan used 5000 rockets to fight with the British in Srirangapatnam. In 1866, Vernae published "From the Earth to the Moon". In 1883, Tsiolkovsky, a school teacher in Russia, published Rocket Equation. In 1926, Robert Goddard designed the first liquid-fuelled rocket. In 1945, Author C. Clarke wrote about space.

In 1963, Sinkam I was launched. In 1963, July 26, Sinkam 2 was launched. Sinkam 3 flew across the Atlantic successfully. Sputnik I, launched on 1957, October 4, by Russians was the first one to go against gravity.

Father of Indian Space is Dr. Vikram. A. Sarabai. The first rocket was sent from Thumba on November 21<sup>st</sup>, 1963. This was just a simple starting.

Warner Wanpiran, a German American scientist and Dr. Kalam said about how our attitude should be when Indians are in NASA. They also said, "You become high, not only due to success, but due to failure too".

Use of INSAT is to warn us on the natural disasters. There are many uses of satellites. They give medical help. Some other uses are:

1. GPS
2. Internet
3. Telephone
4. Television
5. ATM
6. Radio
7. Meteorology



We also get natural wealth from satellite. For example forests, environment, water, help during disasters. There are three common satellite frequency band and dishes. They are:

- C-Band (Used frequently)
- Ku-Band
- Ka-Band

ISRO made rockets (India) like SLV, ASLV, PSLV, GSLV-MK I & II and GSLV-MK-III

	SLV	ASLV	PSLV	GSLV-Mk I&II	GSLV-Mk III
Height	22m	23.8m	49m	42.4m	44m
Weight	17t	40t	295t	414t	630t

Chandrayaan- I was launched by PSLV C11 on October 22, 2008. It reached moon on November 14, 2008. Mangalyan, launched on 5.11.13 is Mar's artificial satellite".

He also showed pictures of great people who are related to space. Then, there was a doubt session. Students asked their doubts to Scientists Er.Ingersol. I too asked my doubts. He explained it briefly.

Then Shri.M.John Robi Kumar, Maroon Team Coordinator gave a power point presentation on 'Nurture Nature'. It was interesting. Nature is a phenomenon of physical world, he started. He said, nature collectively includes plants, animals etc. Then he raised a question, whether the Earth belongs to you or you belong to the Earth. To make us understand, he said a story.

Once, when a Buddhist was walking in a street, he came across a beautiful garden. It was well maintained that the Buddhist went inside the garden itself. There, a farmer was working in the garden. The Buddhist asked him, "To whom does this garden belong to?" The farmer immediately answered with pride that it belonged to him. The Buddhist asked, "Before you were born, to whom did the garden belong to?" The farmer answered that, it was maintained for years by his ancestors. The Buddhist asked, "Where are they?" He answered that they were in grave. The Buddhist said, "If you are one day in grave , to whom will this garden belong to?" This made the farmer think and he realized his mistake. He also understands that the garden (nature) didn't belong to him, but he belonged to it.

He also explained why we should nurture nature. He also explained what had happened to our mother earth. Nature was nice. But now, she is ill. We are the viruses. We cut her hair (forest). We are sucking blood through bore wells. Nature is God's greatest boon to mankind. Our beautiful earth turns into a defaced, ugly surface of land. Water we drink is polluted by oil spills and ruthless industries. 80% of waste goes to land fill. 10% is incinerated. 10% is recycled. One is every seven, go hungry every day and fall to death, but, here waste food. His points were:

Global warming:

- Increase in average global temperature of 2<sup>0</sup>C is inevitable but may go up to 4<sup>0</sup>C.
- Greenhouse gases trapped in permafrost melts, released in the atmosphere, it will cause catastrophic damage, 150 times the current rate of warming.
- Polar bears can't survive as ice melts.
- Bangladesh and Maldives may be wiped off the map due to this.
- Himalayan ice was 3391 sq.km/1962 but now it is 2721 sq.km/2006.

#### Forests:

- We lose about 15 million hectares of forest every year, an area about the size of Nepal.
- We have taken best wood first and left behind degraded forests. So, medicines won't be available for us after years.
- Destruction of one tree is worth loss of more than 32 lakh rupees.
- Destruction of forests leads to destruction of wildlife.

#### Species:

- For every plant species that becomes extinct, up to 30 dependent animals and insects die.
- In India, tiger population has reduced from 50,000 to 2000.

#### Water and nature:

- Over 1.2 billion members of human family lack adequate water day.
- We have polluted and drained our mother earth's aquifers and rivers.
- World's fish are in crisis from over-fishing and pollution.

Bee's colony, collapse. Only if bees are there, pollution can happen. Social injustice happens.

#### Solution:

1. Everything comes from nature. Cherish what you have.
2. Grow organic food.
3. Plant trees (absorb CO<sub>2</sub>).



Hurt of one is the hurt of all and the honour of one is the honour of all. We must remember it. There is no second earth to go when we make our planet uninhabitable. The planet what we live is not gifted to us by our grandparents but, lent to us to handover to youngsters. So let's nurture nature.

Then we went to our hostels. We set our rooms and then we had our dinner. Then, we again assembled at the hall. The next program started.

First, R.S.Anisha of Maroon Team did a PowerPoint presentation. She advised us to have positive attitude towards life. She said eight steps to build positive attitude. They were:

1. Change your focus for the positive. Don't be pessimists, who forget their blessings and think of their troubles.
2. Make a habit of doing everything now.
3. Develop an attitude of gratitude.
4. Get into a contentious education program.
5. Build a positive self-esteem.

High self-esteem	Low self-esteem
Self interest	Selfish
Discuss	Argue
Talk about ideas	Talk about people
confidence	Confusion

6. Stay away from negative influences.
7. Learn to like the things that are need to be done.
  - S - Specific
  - M - Must be measurable
  - A - Achievable
  - R - Realistic
  - T - Time management
  - You have to say 'I can'
8. Start your day with something positive. When you wake up, say "good morning" to your parents and grandparents. If you make mistake, say "I was wrong".

Then, Varsha of Maroon Team did a PowerPoint presentation on the topic, "obstacles to achieve successes". Her points were:

Why is it so hard to become a successful person?

- Lack of plan
- Lack of desire
- Feeling unworthy
- Laziness
- Too big & commitment

"For success you need everything, for failure you need only a few".

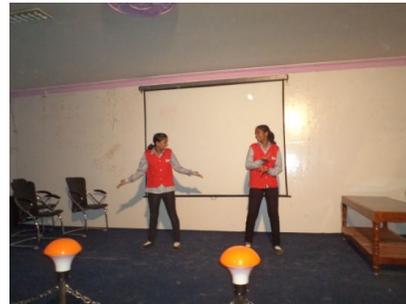
She said about Steve Jobs, the owner of Apple computers had more obstacles to achieve success. Similarly, personalities like Native du Toit, Natalia Partyka and Emmunal Owosso, Yeboah had more obstacles. They many physically challenged people who attained success.

She showed us a video on a physically challenged girl, Jessica Cork. She drives aeroplanes with her legs as she doesn't have hands. There are more

people who suffered, but smelled the fruit of success. They are: Solomon Pappaiah, Chinna Pillai, Sudha Chandran, C.K.Ranganathan, etc. She gave us ten tips to success.

1. Set your goals.
2. Leave your comfort zone & get ready discomfort.
3. Don't be afraid to make mistake.
4. Come out of yourself, experience the realities.
5. Choose to happy always.
6. Think of you & your developments always.
7. Live fully in present.
8. Dare to dream big dream.
9. Never quit when you experience set back.
10. Commit yourself for your dream.

Then we had cultural programs. I too participated in three programs. It was indeed enjoyable. Then we went to our hostels and had a good sleep. Under the guidance of our guides, we felt homely atmosphere as they took great care of us.



## Day 2:

**Date: 10/11/2013**

We got ready for our field visit and sat in the library. At 6:45 am, we started our field visit. We went with our team mates, coordinator and guide.



We saw a roundana. At the centre, there three layers of flowers. We saw the Oath of red ribbon club. We saw a play ground. We also cycus, bamboo, neem, eucalyptus, punnai tree, winker which had white flowers, cashuaraina (if we breaks, it's leaf into two and fix it will fix again) which has fruits like pine.

I saw the way for three hostels which were Narmada hostel, Ganga hostel, and Sindhu hostel. The speciality was that, they were named after rivers in India. I saw Thermodynamics and strength of materials laboratory. We too saw pungu tree,



Morinda, Tintori, Badam tree, Karuval tree, Eetti tree, Tamarind tree, Sisal pinai. I saw a light which had a small solar panel at its top. Then we entered a garden. There we saw many plants, grass, swimming pool and tree like Thalai, cycus, and arari. We saw big mushrooms. We saw 16 bottle palm trees around the swimming pool and have ash colour steam. There was a river too. We also saw Asparagus. There a well and it was surrounded by blue colour flowers. There was an arch for entrance and exit of the garden. It was made of thick leaves and was very nice. There amla plants and pantry vaagai. The path which we walked had plants on its sides. There tow wind mills. There was a plant called Nithaminikki which from the family of Goa tree. There were facilities to park cars. We saw a plant called Morinda. We saw the outlook of Marine lab where a model of ship was there. There was an area which had cracked field. We saw many unknown plants too. We taste a fruit called kurivi palam. It was so tasty. We saw a tower. The buildings top were arch shaped. We saw a plant called which rose coloured flowers. We saw a plant called Partinium. It had white flowers. Its pollen grains pollute air and cause asthma, itching etc. We saw Alpees which is eaten by cows. It is used to bring up fires. We also saw: Sapotta, Mango, tree, Thetti (orange flowers), Mimosa, Maanjium, statue of a white rabbit, Olathi, Rose garden, Musa paraicica, conference hall, pungu, an ornamental plant with violet flowers, Banyan, orchid, basket ball ground, poisonous bamboo and library (windows had sceneries).

Finally, we reached the place where we had started. There I saw an anti-ragging board. I also saw Oath against smoking. When I read it, I understand that 10 lakh people die due to smoking. Smoking cures cancer, paralysis and heart attack. Tobacco has 4000 poisonous chemicals in it.

Then are the five teams assembled in the basket ball ground. We sat round. Then some members from green team were asked to explain their field visit. Then Shri.Velaian handover a book about medicinal plants to Fathima Haashima of green team and said her to read the detail of two plants in Tamil.

1. Keelanelli: It is a medicinal plant used to cure headache, diabetes etc.
2. Kuppaimeni: It is sour in taste, but kills the bacteria present in the stomach. It also cures asthma,

Then we were informed by Velaian sir to collect ten medicinal plants and plant them in our home. Also, we have to write ten medicinal plants and their medical value. We should plant minimum five vegetable plants in our home. Then we had our breakfast.



Then we walked to the auditorium. On the, we got a golden opportunity to meet Dr.Suyambu, the Chairman of PSN college of

Engineering. Velaian sir introduced him to us. Then, I spoke on the before day's program shortly. Then Dr. Suyambu said about the speciality of the library they had, that is, it is always open for 24 hours. Then all of us thanked him for giving this opportunity.

The next program in the auditorium began at 9:10 am. Many students spoke on the program conducted the before day. I too spoke. Then Edwin Sam sir gave his feedback on the reports we has read. He said that some are able to speak just two points. So, we have to observe everyone's speech carefully.

Then Sajeev sir spoke that if we study, we can get job only. So, we should have co-curricular talents with us. We should not sleep. We should be awakened and take notes always. Next, Balakrishnan sir said that we take notes and that's good. But some students don't take notes. The main theme of this training is to develop the students. Taking notes is much essential for our development. He also blessed us and said us to learn well.

Then, Ashwin Niranjana from Maroon team did a power point presentation on positive thinking. His explanation was: Positive thinking refers to focusing on what is good about yourself, other people, and the world around you.

"Watch your thought; they become your words;

Watch your words; they become your action;

Watch your action; they become your habit;

Watch your habit; they become your character;

Watch your character; they become your destiny."

When we are positive, we experience positive feelings. Some tips to overcome negative thoughts are:

- Meditate
- Smile
- Surround yourself with positive people
- Change the tone of your thoughts from negative to positive
- Don't play the victim. You create your life-taken responsibility.
- Help someone
- Remember that no one is perfect and let yourself move forward.
- Sing
- Read positive quotes
- List five things that you are grateful for right now.

Steps for positive thinking are:

- Be an optimist
- Look at the bright side
- Visualize success
- Catch happiness

- Count your blessings

"All you can change is yourself sometimes that changes everything"

—Gary.W.Goldstein

Norman Vincent Peale wrote the book "The power of positive thinking" and he lived for 95 years.

Health benefits of positive thinking are:

- Increase life span
- Lower rates of depression
- Lower levels of distress
- Greater resistance to common cold

Then, a video was shown on how to practice positive thinking. Then Praveesh said feedback of the power point presentation. Next, Senthil kumaran of Yellow Team gave a speech on success and Lakshmi of Yellow Team and Dhanu of Red Team said their feedbacks on the field visit.

Then Shri A.Benzigar Rajan Scientist ISRO Mahendragiri did a power point presentation on "Hydrology". He explained: Hydrology is a process, where the Sun makes water to evaporate, which forms clouds, condenses and comes down as rain. Water is distributed in surface, sub surface and other reservoirs.

Distribution of Water	
Lakes	0.009
Saline lakes/seas	0.008
Streams	0.0001
Vaclose	0.005

Earth's Water - Fresh water 3%

Saline Oceans 97%

Fresh Water - Icecaps & Glaciers 68.7%

- Ground water 30.1%

- Other 0.9%

Earth's Surface Water - Rivers 2%

- Swamps 11%

- Lakes 87%

Nature of water:

- Water is not contained in political boundaries
- The war of next century will be about water

Brahmaputra is the river that originates from the river, Manoceraver in Himalayas. It flows from China to India and then to Bangladesh.

Oceans:-

- Indian Ocean
- Arctic Ocean

- Atlantic Ocean
- Pacific Ocean
- Red Sea
- Dead Sea
- Caspian Sea

Aquatic environments:

Aquatic zones cover 71% of earth's surface. Some aquatics present in the sea are Benthos, Plankton, Nexton, and Zooplankton. The zones under the sea are Bathyal zone and Abyssal zone. The zones on the sea are Euphatic zone, Estvarne Zone and Coastal zone. There are some poisonous creatures too under the sea.

Uses of Sea:

- Climate moderation
- Co<sub>2</sub> absorption
- Nutrient cycling
- Scientific information
- Food
- Pharmaceuticals
- Recreation
- Minerals
- Building Materials

There is a sea called Aral Sea between Kazakhstan and Turkmenistan whose surface water has become depleted. The length of the coastline in the world is 4, 40,000 km. Coast is the area where the oceans touch the land. Sea is the branch of large ocean which touches the land. Canada has the largest coast in the world. About 50% of the world's population are living in coastal areas. Mass of coast 0.5% of the mass of earth.

The main types of water bodies are lakes, ponds and rivers. The river Amazon is the largest river in the world. It is about 6992 km. The depth of river Amazon when more water present is 150km. When there is less water, the depth is 80km. The second largest river is Nile, which is 157km less than Amazon. It passes through Sudan. Ugetta, Egypt and Somalia.

There is a river in China, Chang Jiang with Zangai as its nearest city.

Water usage:

- Irrigation
- Power generation
- Industrial development
- Fisheries
- Navigation
- Cloth manufacturing

Uses of wetlands:



- Filter water
- Protect uploads from floods by temporarily storing some of the water.
- Provide sources of water.
- Wildlife habitats

Mangrove swamps are seen in wetlands. In Kanyakumari, it is present in Manakkudi. Wetlands have water weed, duckweed, beaver, duck and minnow.

#### How wetlands are damaged?

- Draining wetlands
- Dumping chemicals
- Dam up the wetlands
- Climate change
- Adding invasive organisms
- Logging and forestry

Wetlands are used for drinking water.

#### Groundwater:

- Non-removable, if we take above the limit.
- Much greater in volume than either lakes/streams.

By 2025, 800 million people will experience absolute water scarcity and two-third of world population could be under stress conditions. One-sixth of people don't get fresh water. The causes of fresh water shortage are dry climate, drought, desiccation and water stress.

#### Indian Coastal Zone:

They extend from Sundar Bans in west Bengal till the Rann of Kutch in Gujarat-5700 km. Lakshadweep, Andaman and Nicobar islands constitute 1810 km. Ganga starts from Glacier, Gangotri.

#### Tamil Nadu coastal zones:

- Coastline is 1076km.
- There 591 fishing villages and 9 lakh fishermen.
- There are 6000 high-speed boats and 50000 catamarans.
- About 4.25 lakhs ton fishing products are produced per year.
- About 2000 crore rupees worth fish products are exported each year.

#### K.K District and its coast:

1, 18,387 fisher folks at 44 villages is 26% of Tamil Nadu. Fisheries sector is the backbone of district economy.

Then Ashwin Niranjana said the short feedback on the presentation. Next, we went to see the model of a ship. It was so big and when we entered it, we saw machines like emergency air bottle, compressor, generator etc. The generator was the biggest machine in them. We saw marine propulsion and auxiliary laboratory. We walked through the accommodation ladders. We saw main engine. Then Thamilarasan sir, fourth engineer, who is from Pondicherry,

working in an Indian ship, explained the whole ship model. He said that his ship travels to South America and he has gone across, nearly 20 countries and has seen two wonders of the world. He explained us that: A ship runs with main engine. This is a model of ship built for nine crores. An original ship would be 5000 crores. There two departments:

1. Deck department - It has captain
2. Engine department - it has a junior engineer, fourth engineer, third engineer, second engineer, first engineer and engineer.

India gets diesel from Saudi Arabia. His ship too does this work. Apart from diesel, it also carries coal, grains, sugar, cattle career, and containers and transports them. The vessels in his ship are of 2, 79,000 tonnes. They vary on the ship's size. Cruse line vessels are also there. There the people get more salary. Iron ore and crude oil are also transported by their ship.

Queen Elizabeth vessel is the most luxurious one in the world. It is much costly, that is, we must pay 50 lakhs to travel in it.

There are two types of engine:

- Four stroke engine
- Two stroke engine

Generators present in a ship are used to generate electricity. A ship does not sink into the water body due to its buoyancy. A vessel in his ship is MT motor tanker from putli. His ship is twenty five years old. The wonderful moment he had with his crew members was the crossing of the equator and a big party was arranged for that.

To fight against fire, they usually used red colour pumps and fixed fire fighting system where carbon dioxide is being used. They don't have to worry about food as there chief cooks and they always get hygienic food. Reverse Osmosis is a method by which their ship gets water. When their ship went to a dangerous place called Malaka, there were some methods for security there. He is going to learn a security course too for it. IMO - International Maritime Organisation has made some orders for it. Safety is much important in a ship. We have to wear uniform, helmet, etc in a ship. These are called as PPV (Personal Protective Equipment).

There oil pumps for lubrication. We have to cool water pump and sea water pump. All these must be done to an engine. There will be a proplur and a fly

wheel in an engine. The oil used is HFO which is of 70 tonnes. It is taken from a port called Fijaria. Anchor is also there.

There will be a propeller made with alloy metals like chromium. It is the fan in the ship. It is about 5 to 6 meter. We can change the direction of ship by Rader. There is valve used to get water. Life boat and life draft are used during accidents. The speed of their ship is nearly 250 km/hr. There will be valve called gate valve. It uses magnetic compass sometimes. The engine in an original ship is six time the size of the model engine. We were much surprised to hear it. Diesel oil is settled in a settling tank. Its capacity  $2.6\text{m}^3$ . Process how ship works was in the form of a diagram. There will be a boiler whose capacity is  $1.728\text{m}^3$ . There is an auxiliary boiler in the ship too. There will be busbar chamber, control desk, fire alarm panel, lube oil pressure, fresh water pressure instruments. There will be fresh water generator motor and air compressor motor. The boiling point of water is  $100^\circ\text{C}$  and it is reduced to  $60^\circ\text{C}$  using vacuum. This principle is used in a fresh water generator. We saw incinerator diesel oil tank.  $\text{CO}_2$  fixed fire fighting system is one which has 130 bottles of  $\text{CO}_2$ . There, we saw emergency generator switch board, dry chemical fire extinguishers and chemical powder extinguishers and chemical foam fire extinguishers. There are 112 extinguishers in Thamilarasan sir's vessel.

The captain won't drive, but he has the overall responsibilities. His explanation was very clear. Many students, including me, said the feedback. Then we had our lunch. Then we went to see an aircraft. There, Priyanka mam, assistant professor in aeronautical engineering explained us about the aircraft. She explained that: this is Sesna aircraft where two pilots and two people can only travel. Its components are Fuselage, Wing (Low, Middle, and High), propeller, antennas. This plane has high wing. Wings have more pressure in the bottom. So, they pitch up.

An aircraft also has Radar, pedal and two levers. When these two levers are being pulled, the aircraft moved forward. Piston engine is being used in this spacecraft. There are two types of engines. They are:

- Piston engine - It is used in small aircrafts.
- Gas turbine engine - It is used in large aircrafts.

Under the wings the engine is being fixed. In large aircrafts, the engine can be seen out. Fuel can be saved in wings and the petrol used is white petrol. After the fuel is becoming empty, fuel is taken using pipe. Mono cork is the one that has no construction and has only one layer. Semi mono cork is different from it.

There will be a rudder in the aircraft. There will be a stabilizer called elevators. Aileron will be present under the wings. The main components in an aircraft are:

- Rudder:  
If it is turned left, the aircraft goes right and vice versa. This movement is known as Yoying movement.
- Elevator:  
When it is moved up, the plane moves up and vice versa.
- Aileron:  
If there is no wing, the plane won't fly. There are four parts:
  - ❖ Lift - Upward force
  - ❖ Weight - Downward force
  - ❖ Thrust - Right side force
  - ❖ Drag - Left side force

An aircraft runs according to Newton's third law.

Communication is done in an aircraft using altitude indicator or communication radio etc. Using them we can find how much altitude is the plane, how much density is the plane and how much pressure is the plane. There will be a black box which won't burn easily and is used to communicate in long distances.

Sometimes there will be traffic in sky, that is, when two aeroplanes are going to land, they may clash each other. So, to avoid this, one aeroplane will be landing while the other will be rotating around the sky for at least two hours. Then Achsah of green team said feedback.

Then, we entered the thermodynamics laboratory. There we met Mr. P.Ganesh. Priyanka mam and Mr. P.Ganesh explained us about the experiments and instruments present there. Mr. P.Ganesh explained:

- ❖ Red Wood Viscometer;  
It is used to find out oil viscosity. It is also called as Say bolt viscometer. One side of it should be filled with oil. Heated water should be poured on the other side. The heat from the water gets transferred to the oil and gets collected down. So, as temperature increases, viscosity decreases.
- ❖ Metal bar apparatus:  
Heat is transferred in a cylinder and the reading is noted.

We also saw Air conditioning test rig-R22, Four stroke petrol engine etc. We also understood about the terms Suction, Compression, Power stroke and Exhauste.

Then, we entered the fluid mechanics & machinery laboratory. Priyanka and Mr. P.Ganesh were with us. We saw Pelton turbine testing. There was an experiment, wind Tunnel. This is used to analyse air flow when an aircraft flies. The cross

section of a wing is called airfoil section. We must fix this cross section in this wind tunnel. When RPM is being on, flow increases and flow is analysed.

There was another experiment, Honey comb layer. When it is on, it will be so airy. It sucks air and the turbulent is converted to laminar. We also saw a gear pump. Then I said a feedback and thanked him. Then we returned to the hall. There Meera of blue team did a PowerPoint presentation on water resource management. She explained that: Fresh water has been depleted by over population, scarcity and pollution. Water use and development of demand in agriculture is 24% and in houses 6%. A study conducted in 1993 says that, the use of water has increased. In India, we get 3 trillion m<sup>3</sup> of water each year through rain. Often Monsoon failures happen. Rain water harvesting gives the purest water for drinking. Agriculture uses harvested water. Nearly 50-60% of rainwater is lost. There is acute soil. Surface flow of rivers like Ganga, Indus, Mahi, Cauvery and Monsoon flood cause considerable damage. Groundwater is used through wells, bore wells and tap supplies too. So, we have to conserve water for future. Water supply is for drinking and other purposes. Sanitation is a hygienic means of promoting health. Steps to reduce polluting water are:

- Reduce pesticides.
- Reduce industrial wastes
- Through individual needs, don't pollute it.

It was very useful. Then Shri. Antony Evans Matric. School, Nagercoil did a power point presentation on wildlife in K.K. wildlife sanctuary & its management. Wildlife includes organisms from microscopic to African elephant to blue whale. Zoo is one of the geographic zone of India. There are 76 amphibians and 177 reptiles. In Western Ghats, there are 120 mammals.

Keystone species = limited number of species.

i. Fishes:

Endangered - 17%

- Common Rasbora
- Eel
- Xenentodo cancila
- Cat fish
- Sleeping goby

ii. Amphibians:

They live on land and water.

- Common Indian tree frog
- Verrucose frog (Endemic to W-G)
- Dusky Torrent Frog
- Bronze Frog (W-G)
- Golden frog
- Bed dome's frog

- Indirana frog
- Ring frog(rare)
- Common Indian Toad
- Bush frog
- Short webbed frog(W.G)
- Gliding frog(beautiful)
- Caecilians

iii. Reptiles

- Green Vine snake
- Green Keel back
- Olive Keel back
- Indian Rock Python
- Red Sand Boa
- Russell's Kukri
- Bronze back tree snake
- Indian Cobra
- Russell's Viper
- King Cobra
- Green Lizard
- Chameleon
- Gecho
- Monitor Lizard

iv. Birds

Our state bird is emerald dove.

- Indian Eagle
- Owl
- Black Eagle
- Long-billed vulture
- Indian Peacock
- Blue-faced Malkoha

v. Mammals

- Lion tailed monkey
- Nilgiri Thar



Values of wildlife:

Positive	Negative
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Ethical	Name to crops
Commercial	Diseases
Cultural	
Recreational	

Threats:

- Forest fire
- Fragmentation

He showed the pictures of all these organisms. He showed the pictures of culinia eaten by lion tailed monkey. He also showed the picture of orchids, fungi & flowers. To save all these, we have to change green deserts into nature forests. Nature education needed. He ended by quoting, "Love, Explore, Conserve!"

Then we departed from the college. It was such a wonderful camp. We enjoyed a lot. It was very informative too. I thank KAP for giving me this opportunity to take part in the scientific camp.



Thank You