

# ABSTRACT BOOK

INDIAN SCIENCE & ENGINEERING FAIR (INSEF)

## INSEF National Fair

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(The abstract text provided is exactly as submitted by the participants)

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**Project Code: BIO-01 (Team)**      **Online ID:162**

**Title: Fiber from weed**

**Subject Category: Biology**

**Name: Ayesha Fahima MS& Deepika C N Std: 9**

**Guide: Sadhana Hebbar**

**School: Sudana High School; Nehrunagar; Putur**

**ABSTRACT:**

We have a lot of natural fibres available like cotton jute and sisal etc. We thought of using a very common weed growing in the wasteland- the communist plant or the Eupatorium.

The stem of this plant is used in making the fibres. We have soaked the stem in water for a week. The inner portion is got by removing the outer portion of the stem which becomes soggy. The fibres thus got are sun dried for a week or dried in the oven at 40 degrees for 30 minutes. The threads got are processed using limestone.

These threads can be woven to get the ropes of different thicknesses. The strength of the ropes has been tested against the ropes of jute and coir available in the market. Various weights have been suspended from the ropes to test its strength.

These fibres can be used in the manufacture of doormats; bags; telephone mats and window screens. Colours and patterns can also be added to make it attractive and increase its durability.

It is a very common unwanted plant growing in our area which cannot be easily removed. So by using this plant for the preparation of ropes; we can say we are trying to solve the problem of weed removal and also make a utility item.

**Project Code: BIO-02 (Team) (Jr)**      **Online ID:163**

**Title: Heel healing cream**

**Subject Category: Biology**

**Name: Anjaki. K& Sanjana P Std: 8**

**Guide: Prathima NG**

**School: Sudana High School Puttur**

**ABSTRACT:**

Normally; people suffer from cracked feet in winter and in our area which is very rainy people suffer here from fungal infection of the toes. Various application are available in the market which are usually chemicals and some people may be allergic to these chemicals also. So we thought of preparing some cream which helps in reducing both the problems. People in our area use roots of certain plants to relieve the pain and the cracks. So we thought of making use of this ancient knowledge for the preparation of the cream. My uncle throws the bee wax after removing the honey. So we combined both these to make our cream.

We have used root extracts of Cyclea peltata and wild Ixora plant in coconut oil. After filtering the oil with the extract; we have taken 70gm of bee wax heated to melt the wax. The mixture is stirred regularly during the melting process. After complete mixing of the oil and wax it was poured into a container. It is allowed to cool for 30 minutes. On cooling; we get a cream which can be directly applied to the cuts; wounds; cracked heels or any other injured

part of the human body.

We have got a comparative testing of our product against the commercially available cream and found that our product better in pH value; toxicity level and besides it does not contain any harmful chemical substances

This cream is effective in reducing the pain of cuts and wounds besides the healing property. It is comparatively more cheaper; effective and less harmful than the creams available in the market.

**Project Code: BIO-03 (Team) (Jr)**

Online ID:216

**Title: Preparation of an effective herbal mouthwash**

**Subject Category: Biology**

**Name: Mansha Ashraf & Haneen Std: 6**

**Guide: Dr. Phirdose Ashraf**

**School: Yenepoya school; Jeppinamogaru; Mangalore**

**ABSTRACT:**

Dental caries ; commonly termed as tooth decay; is a bacterial ( Streptococcus mutans ) infection causing destruction of tooth structure .

Maintenance of good oral hygiene prevents most dental diseases as adequate cleaning of teeth and mouth dental plaque ; the bacterial source and causative factor of most dental problems.

Most people do physical cleaning of teeth with twigs or toothbrush once a day though atleast twice daily brushing is recommended. Thus dental caries is the single most chronic disease affecting 60%-85% children and most adults in India.

Studies have shown that apart from brushing; a germ-killing mouthwash ( which is convenient to use ) ; can significantly reduce occurrence of plaque. A mouthwash when rinsed with reaches 100% of mouth surfaces unlike only brushing which focuses on teeth (25% of mouth) ; thus acting on more bacteria.

Our aim is to prepare an anti-bacterial herbal mouthwash which overcomes the disadvantages of chemical(chlorhexidine)mouthwashes . Chlorhexidine is known to discolour teeth and oral surfaces; alter taste sensation and is not proven safe for children;pregnant women and nursing mothers.

We have selected traditional guava ( Psidium guajava); mango(Mangifera indica) and neem (Azadirachta indica) leaves in various proportions to prepare the mouthwash.All of them are known for their anti-bacterial properties and guava leaves for astringent; immune-boosting(vit C) and anti-oxidant effect too. Astringent effect helps in reducing bleeding and swelling of gums too.

We aim at preparing a readily available; cost-effective; easy to use ; safe; anti-bacterial mouthwash especially for the larger Indian population.We are also putting efforts to make a caries-preventing chewing gum with similar ingredients .

A mouthwash is relatively easy to use . We believe that if use of an effective and safe mouthwash is made widespread and also the awareness of the multiple benefits of mouthwash is increased ; it will significantly help in reducing one of the most common disease in the world -- dental caries.

**Title: to study the electrical conductive properties of dye-synthesized bacterial cellulose membrane**

**Subject Category: Biology**

**Name: Rohit Gajanan Mutalik & Dhanyeshwari Manoj Std: 9**

**Guide: Sitalakshmi Parmeswaran**

**School: Modern English School**

**ABSTRACT:**

Bacterial cellulose (BC; also known as microbial cellulose; MC) is a promising natural polymer

synthesized by certain bacteria

Bacterial cellulose is produced in several ways by fungi. These bacterial cellulose has unique properties.

In our research; an attempt is made to harvest fungi *Acetobacter Xylinum* from tea broth and prepare bacterial cellulose were prepared from different samples (vinegar; rice washing; coconut water) its conductive properties were studied. The harvested fungi was inoculated in the samples and the growth of cellulose was monitored under varying pH in static condition and. A standard nutrient broth was also inoculated with the fungi. The cellulose yield was 3; 4.73; 5.32; and 8.95 g/liter were obtained after a 15 days of cultivation. The yield was more in coconut water; and nutrient broth. And The celluloses were purified using sodium hydroxide {NaOH} and Calcium hypochlorite {CaOCl<sub>2</sub>}.

The bacterial celluloses membrane thus formed were dimensionally stable; had a paper-like appearance.

The celluloses membranes from various samples were directly immersed in the aqueous solution of C<sub>27</sub>H<sub>29</sub>ClN<sub>2</sub>O<sub>3</sub> and H<sub>3</sub>PO<sub>4</sub>. The membrane were dried at room temperature. The cellulose membrane were tested for its physical properties and electrical conductive properties.

The results indicate that the membrane had good tensile strength 5.5kgf. The membranes were tested for the electric conductivity. The initial conductivity was 0.33 Scm<sup>-1</sup> which increased to 1.5 with coating.

This work provides a new method to prepare flexible sheets from fungi. It is biodegradable and cost effective and thus opening a new field of potential applications of BC materials.

**Title: Phytoplankton as biological sinks for carbon sequestration**

**Subject Category: Biology**

**Name: Anjaneel D & Std: 12**

**Guide: Sarayu Rani. R**

**School: Chettinad Vidyashram; R.A.Puram; Chennai-28**

**ABSTRACT:**

The oceans have been absorbing a large amount of carbon-di-oxide since the industrial revolution and this leads to ocean acidification. Phytoplankton grows in the euphotic zone of

the ocean, and act as biological sinks for carbon sequestration. Industries can use phytoplankton to reduce their carbon foot print by using the algae based CO<sub>2</sub> capture as it is one of the best ways to increase carbon credits is using the concept of sequestration. Conventional sequestration techniques, despite all its advantages are second only to the vastly effective and attractive option of biological sequestration.

More than 1.7 billion people in the world die from hunger. A far greater number about 3 billion people (with special reference to coastal areas) suffer of “hidden hunger” i.e., nutrient deficiencies which can be fatal as the reduce immunity, reduce lifespan, and reduce mental abilities. Bio-fortification in this context is the best means to improve public health and increasing nutritional value of our daily diet. By increasing the level of the producer of the ocean (Phytoplankton), on both quantitative and qualitative aspects, the following consumers are benefitted on large scales i.e., increasing the nutrient content of producers and thereby increasing the nutritional content of the consumer.

In this project I have proposed a method to limit the rate of ocean acidification and to biofortify sea food by selecting a special type of phytoplankton called Tetraselmis chuii.

**Project Code: CHEM-01 (Team)      Online ID:210**

**Title: Low cost synthesis of Zinc Oxide Nanoparticles for waste water management.**

**Subject Category: Chemistry**

**Name: Koushik. P& Vivek Jadhav Std: 11**

**Guide: Ankita M A**

**School: Hongirana Independent PU college; Amatekoppa**

**ABSTRACT:**

Our country being a developing nation; have upraise in industries such as dye industries; textile and many more industries which generate huge amount of colored effluent into the environment; which has significant undesirable biological and ecological effects. Several processes have been developed over the years to remove dyes from industrial waste waters such as chemical precipitation; membrane filtration and few other processes. However; none of these methods has been widely used due to relatively high-cost and low-feasibility for small-scale industries. In contrary; the Adsorption technique is more economical; simpler and is capable to efficiently treat dyes in their more concentrated forms. Further; adsorption techniques do not have secondary sludge disposal problem; making it eco friendly and most promising technique.

Metal-oxide nanoparticles; in particular; have been widely evaluated for the removal of various contaminants from water. Their large surface area and higher reactivity makes them an ideal choice for removal of contaminants.

In a typical route; zinc oxide nanoparticles were prepared by adding 100 ml of basic precipitant 0.4M NaOH solution into a 100 ml of 0.2M metal salt under constant stirring. About 50 mg/L cetyl tri methyl ammonium bromide (CTAB) was added as capping agent which inhibits the anomalous growth of metal hydroxide crystals during the course of precipitation. Then the resulting solution was kept at room temperature for about 3 hrs under constant stirring. The obtained slurry was centrifuged at 1000 rpm and precipitate was washed several times with water and alcohol; dried in an oven for a period of 1-2 hrs at 600 C. Then powder is further heated in silica crucible for a period of 6 hrs at 6000 C. Finally; the resulting adsorbent was stored in air-tight container for further use to adsorption experiments.

Adsorption studies were carried out by batch adsorption techniques in a 250 ml of stoppered flask (Erlenmeyer flasks) that contain 100 ml of 20 mg/L of MGO solution. To that we have added 200 mg/L of ZnO nanoparticles. The experiments were carried out in thermostated shaker at 200 rpm. The flasks were removed from the shaker after 60 min and sample was analyzed by a UV-vis spectrophotometer (Shimadzu UV-1650; Japan) at 617 nm for MGO. The amount of adsorbate adsorbed at equilibrium condition;  $q_e$  (mg/g) was calculated by the following equation:

$$q_e = \frac{(C_0 - C_e)V}{W}$$

where  $C_0$  and  $C_e$  are the initial and equilibrium concentrations (mg/L) respectively.  $V$  is the volume of solution (L) and  $W$  is the mass of adsorbent used (g).

**Project Code: CHEM-02 (Team)      Online ID:343**

**Title: MOSQUITO ATTRACTION AND ELECTROCUTION**

**Subject Category: Chemistry**

**Name: V. SWATHI KRISHNA & D. MONIKA Std: XI TH STD**

**Guide: Mr. S. Alphonse**

**School: kaligi Ranganathan Montford Matric. Hr. Sec. School**

#### **ABSTRACT:**

Our project relies on mosquito attraction and electrocution.

Mosquitoes are Attracted:

1. Towards human beings because of the peculiar smell coming out of the body (sweat).
2. The Carbondioxide we exhale.
3. Visual
4. Heat.

In our device all the four concepts are used.

#### **DESCRIPTION AND WORKING OF THE PROJECT:**

The mixture of three solutions with definite proportions is kept in a glass flask. Air is passed into the solution through the air pump. The vapours of the solutions come out from the two wire mesh of different hole width having a small gap in between them. An electric current is passed over the wire mesh. A blue bulb is fixed which also acts as a night lamp.

The mosquitoes are attracted towards the wire mesh thinking it as the human being and sits over the wire mesh. Then the mosquitoes are electrocuted at once; since we are passing current through the wire mesh.

#### **PRODUCT'S USEFULNESS TO THE SOCIETY:**

45 ml Mosquito repellents of different companies like MORTEIN; ALLOUT; GOODKNIGHT etc. are available in the market which cost Rs.60/- to 65/-. But 50 ml of our Mosquito liquid costs Rs.35/-only. PEST.O.FLASH; PEST CONTROL (INDIA) "THE FLYING INSECT CONTROL SYSTEM" available in the market kills the flying insects and not the mosquitoes. Moreover the mosquitoes are repelled by it. The cost of the instrument is Rs. 4950. Balaji Electronics; Mosquito Swatter bat which is operated manually with 3 Volt batteries costs Rs.350/-. But my Mosquito Attraction Device operated automatically. Hence it is energy efficient.

When liquidators like Mortein; Good Knight; Allout ; etc.; are used the doors and windows are closed. Hence we are forced to breathe -in the vapour that emerge from the liquidator; which makes even the children be victimized to lung diseases like Asthma; etc.

Our instrument is to be fixed in the inner part of the windows with the windows; open Mosquitoes which are attracted towards it are made to sit on the electrocuted nets which make them be killed. Breeze will flow freely inside our home leaving us sleep happily and peacefully; being Rejuvenated promptly we can attend to our daily chores promptly. Hence; our instrument kills the mosquitoes but at a comparatively lower cost.

This instrument is portable; much cheaper; more efficient; consumes less electric power and it is pollution free; free from Chemical side effects; has no poisonous fragrance. It is an easy solution to live a healthy life. This is more useful for houses; bungalows; conference halls; Dormitories and big Auditorium etc.

According to the sizes of the rooms; we can have different sizes of this instrument. My system will provide sound sleep without the disturbances caused by the mosquitoes. My innovation will be highly useful for the destruction of mosquitoes at low cost.

#### CONCLUSION:

Our initiative is to eradicate the presence of mosquitoes through electrocution. Its cost is Rs. 1750/-. When manufactured at a large scale; the cost will drastically come down to Rs. 1500/-. People might feel that the cost is too very high. In fact; it is a life time investment. Once brought; it will last for many years. The re-fillable liquid used for this for a period of 50 to 60 days quantity of 50ml costs Rs. 35/-. Then; the day today cost does not amount even to 60 paise. In case of being affected by Dengue; the blood culture leading to its diagnosis costs around Rs. 5000/-. The private reputed Medical units charge almost Rs. 1 Lakh for the intensive treatment. Compared with this fact; our amount is too less. Moreover; we humbly do entreat our Government to distribute our invention; free of cost as they distribute Mixie; Grinder; Fan and the like.

**Project Code: ENERGY-01**    Online ID:235

**Title: To study efficiency of Molasses for synthesis of Solar cells**

**Subject Category: Energy**

**Name: Varun Menon& Std: 9th**

**Guide: Mrs Sitalakshmi.P**

**School: Modern English School; Chhedanagar;Chembur;Mumbai**

#### ABSTRACT:

Plants use the free electrons to make carbohydrates; the original carbo-loading. Solar cells use the electrons to make streams of electrons. That's called an electric circuit.

We already have solar cells called photovoltaic cells but they prove to be very expensive. Hence; my project aims to build a natural dye synthesized solar cell; with much lower cost than common commercial silicon solar cells.

For building the solar cell; glass plates which were coated with Titanium dioxide (TiO<sub>2</sub>) was used. The glass plates were then sintered and stained with various molass dyes extracted from sugar and dates . A number of experiments were conducted with crude and solvent dye extracts. The catalyst coated counter electrode faces the TiO<sub>2</sub> film. The iodide electrolyte solution (0.5M potassium iodide mixed with 0.05M iodine in water free ethylene glycol) was placed at the edges of the plates. The liquid was drawn into space between electrodes by capillary action. Two binder clips were used to hold the electrodes together. The absorption spectra of dye solutions were taken using a spectra photometer. Then the voltage of the solar cells was measured. The best results were shown by molasses from sugar leaves; followed by date which was followed by black grapes. Thus; I was able to demonstrate that molasses dye

which is a waste is effective in synthesizing solar cells and can be harnessed to create electrical energy.

**Project Code: ENERGY-02 (Team) Online ID:243**

**Title: HYBRID BICYCLE**

**Subject Category: Energy**

**Name: NIKUL GARAIYA & MAHEK MAKADIYA Std: 9**

**Guide: dhaval madani**

**School: K G dholakiya school; Nr: balaji hall; rajkot**

**ABSTRACT:**

Join the horizontal rode near about 1.5 ft at the former part of the cycle's seat. Join one more rode near about 3 ft perpendicular down side. Now take the third rode of 2 ft and join it with the cycle's rode then join the other side of the rode with the half circle's zigzagged part like it can stay horizontal. Now join the horizontal rode with the touching point of the perpendicular rode. Put two or four spring of 12 cm between the semi circle and the perpendicular rode to the down side. Fix the down points of the spring like a particular position as showing in the model. Join the half circle rode with the flywheel in a way that the zigzag part of it fixes with it. Now join the fly wheel with the peddle. When the circle goes on the rough road; the rider will often try to peddle with this we can save the energy. When the cycle pass on from very rough at ruler or mountain areas; because of riders weight; the seat goes down from the back side and the rode which was joined ahead will be pulled and with that the rode also pulled with it. At that time the spring will also pull and after that when the springs take its real position the fly wheel which is joining with the semi circle will turn. With that situation the rider will get the help to hit the peddle.

**Project Code: ENERGY-03 (Team)**

Online ID:362

**Title: LOW COST BIO GAS PLANT**

**Subject Category: Energy**

**Name: PRADEEPA.S& THARANIS Std: 11 TH**

**Guide: PRIYADHARSINI. A**

**School: BHARANI PARK MAT. HR. SEC. SCHOOL; KARUR.**

**ABSTRACT:**

Producing bio - gas from bio - wastes is our project. We have collected vegetable and fruit waste in a basket for 2 weeks. We have added yeast to them closed the basket. They are decomposed and bio - gas is produced. Bio - gas plant is plugged by a tube and gas is collected in a tank. Then gas is fired and the experiment is proved. This bio - gas plant is used in our house for house - hold purpose.

**Project Code: ENGG-01 (Team) Online ID:257**

**Title: TO PREPARE WATER RESISTANCE AND HEAT RESISTENCE BRICKS FROM WASTEGE PLASTIC;BANTONITE AND SAND AND COMPARE ITS QUANTITATIVE DATA WITH NORMAL BRICKS**

**Subject Category: Engineering**

**Name: Mansi Nilesh Bhai Dalsania& Kairavi Dipak Bhai Rachhadiya Std:**

**9**

**Guide: Hiral Thakar**

**School: Shree G K Dholakiya schools**

**ABSTRACT:**

In our construction media many types of bricks available; having some disadvantages and so prevent that thought of making bricks without that problems. This brick is made up of plastic; sand and bentonite. As a plastic polypropylene used here. The proportion in which plastic:sand:bentonite is use is 50:40:10. As per this proportion 250gm plastic; 200gm sand;and 50 gm of bentonite is used for making one brick of 500 gm. This manufactured brick has has 29.55N/nm<sup>2</sup> compressive strength while the existing one has 5 to 30 N/nm<sup>2</sup> .The heat resistency at 83 C;there is negligible change.As its water resistency is higher than normal brick so the possibility of being moisturize is very less.these bricks can be used as widely in construction of dam; beamcoloumn and bases of buildings.

**Project Code: ENGG-02**

Online ID:301

**Title: Micro weather forecast with the help of GSM based AUTOMATIC WEATHER STATIONS**

**Subject Category: Engineering**

**Name: AYUSH PANARA& Std: 10**

**Guide: milanbhai panara**

**School: Shri G.K.Dholakiya school; University road; Rajkot**

**ABSTRACT:**

Today Weather forecasting is important to save people & reduce causality from upcoming natural weather phenomena. Weather forecasting is based on weather data; satellite picture; geographical condition and much more. At present weather data is manually collected from weather stations due to cost effect factor. Hence limited weather data are available for analysis which results into a large scale forecast. Due to manual system more time is used to convey messages and thus weather data cannot be sent in a real time. These consecutive differences require to established new weather communication system which is based in real time to meet the needs of the people and to achieve the use of people.

So; to reduce the cost and to get weather data in real time; I have created a system which will measure weather data and will transmit / receive data through GSM communication and also will be updating weather data into web site. By the analysis of more weather data; accurate weather forecast can be issued which will be helpful for different emergency/rescue teams (i.e. Disaster management) before time and hence; vulnerability reduces with respect to all types of hazards and natural distress.

The analysis showed my system is better in real time data transmission; in accurate forecasting and also is able save government expenditure at greater heights compare to existing weather system. Thus I have created a novel system that can replace the existing expensive weather system with a more accuracy option.

**Project Code: ENGG-03 (Team)**

**Online ID:306**

**Title: a novel stair climbing stretcher**

**Subject Category: Engineering**

**Name: Deepesh Jain& Kunal Sharma Std: 10**

**Guide: Sitalakshmi Parmeshwarm**

**School: MODERN ENGLISH SCHOOL CHHEDANAGAR CHEMBUR  
MUMBAI**

**ABSTRACT:**

Stretcher is the most important part mainly for the patients;but many a times it becomes difficult for the stretcher lifters or carriers to carry the patient in a narrow inclined path;road;area like staircases or during landslides etc. It not only becomes difficult or awkward for the lifters due to their height differences but this imbalanced support creates many problems even to the patients. we have come out with a simple solution for this problem with a device which can automatically take the patient up an down the staircase or through a inclined path reducing the work of the lifters or carriers. To make this device we have used some pipes;motors;PCBs;batteries;wires;wheels etc. experiments were carried out to see the efficient working of the project.It was observed that climbing and getting down from the stairs were easy and comfortable with minimum bumps

**Title: Tyre Pressure And Its Impact On Automobile Fuel Efficiency And Carbon Footprint**

**Subject Category: Engineering**

**Name: Samyukt Sriram & Siddharth L. Pai Std: 6**

**Guide: Suryanarayana Rao S.R.**

**School: Sishu Griha Montessori and High School; Bangalore**

**ABSTRACT:**

This project attempts to assess the impact of under inflated car tyres on fuel efficiency and greenhouse gas emissions in the Indian context. It is expected that lower tyre pressure in a car means higher tire rolling resistance; increased fuel consumption and higher carbon footprint. Studies on the factors impacting this in India could enable assessment of the scope for car owners to minimize their environmental impact by controlling tyre pressure which is a factor directly under their control.

**Experimental Procedure**

1. Select a car (mass =  $m$ ) and set tyre pressure at different levels in the range of -30% to 10% of the recommended tyre pressure ( $P$ ).
2. Accelerate the car to a steady speed of 20 kmph ( $v$ ) on a straight flat road; shift gear to neutral; measuring distance ( $S$ ) travelled before car stops.
3. Repeat experiments and arrive at a best fit curve for co-relating the pressure ( $P$ ) and stopping distance ( $S$ ). Calculate rolling resistance ( $a$ ) as  $(\frac{1}{2}m*v^2=m*a*S)$ . Plot % change in ( $a$ ) Vs ( $P$ ) from their values at recommended tyre pressure as a measure of impact of tyre pressure variation on rolling resistance.
4. Survey a population of different cars at petrol pump; measure tyre under inflation (% change from recommended tyre pressure) incidence in car population.
5. Derive a weighted average increase in rolling resistance for the car population; from the above data sets.
6. From literature survey; estimate the amount to which tyre rolling resistance contributes to overall fuel consumption in a car.
7. Multiply the weighted average increase in rolling resistance due to tyre under inflation with the contribution of rolling resistance to overall fuel consumption in a car to arrive at the net impact on fuel consumption.
8. Convert the incremental fuel consumption factor to a net carbon impact estimate with available data on carbon release by each litre of fuel.

**Results Achieved**

1. Experiments done on Toyota Innova & Hyundai i10 for impact of tyre pressure variation on rolling resistance. Rolling resistance increases ~35% for 40% tire pressure decrease
2. Petrol pump survey indicated that incidence of under inflation of tyres in cars is relatively lower in India; ~79% cars tire pressure < 10% below recommended pressure; 14% of cars at 10-20% lower than recommended and only 7% cars >20% under inflation
3. Applying rolling resistance increase factor weighted by under inflation incidence in the sample we have used; yields average 4.2% increase in rolling resistance for overall car population.
4. Rolling resistance contributes ~5% of car fuel consumption. Multiplying this with the 4.2% increase due to under inflation yields ~0.19% higher fuel consumption that can be reduced by tighter tyre pressure monitoring

5. Results indicated tyre pressure control in cars seems to be better in the sample studied; yielding smaller scope for further fuel and environmental savings through this route
6. Study with larger sample needs to be conducted to validate findings for country as a whole.

**Project Code: ENGG-05**

**Online ID:369**

**Title: RPAV (FLYING AUTONOMOUS DRONE)**

**Subject Category: Engineering**

**Name: AKASH GHOSH& Std: 10**

**Guide:**

**School: MAHARISHI VIDYA MANDIR ;CHETPET;CHENNAI**

**ABSTRACT:**

A Remotely Piloted Aerial Vehicle () is a working model which can be operate from ground station by using a radio controller and a pc and the sensor system . This working models development has been attaining by enthusiast's and armatures as a part of their hobby. We planned to introduce and install some useful application in our RPAV.

\*This aircraft is designed specifically for this purpose

\*This project proposes for this event to exhibit our design and development of a RCPA with ground control piloting system which is completely autonomous.

\*The RCPA will be installed with an onboard camera 20x zooming power .

\*This system has the ability to fly in the of radius of 30 km by seeing the pilot's view on our ground control monitor or just by programming the mission.

\*And also supports a wide range of telemetry making the flight realistic n user friendly  
(CAN BE OPERATED ONLY BY TRAINED PROFESSIONAL)

\*very silent flying at full throttle

\*This system is completely backed up wid gps; live vedio broadcasting; antenna trackers etc

And other useful features of the gps . Such as

- Auto return to home
- Path way navigation
- Auto circling mode
- Stabilize destabilize

\*Such features can be simply used to follow target ; maintain constant attitude to gather info or keep track on target .

\*The RPAV IS capably of flying in any climatic condition

\*technically capable to fly over 25;000 ft

\*1 hour of flying endurance ( BATTERY CAN BE UPGRADED IN ORDER TO ACHIEVE MORE FLY TIME)

\*maximum speed attained 160kmph

\*And 4-5 kg of payload (can be used for dropping objects or explosive on target )

#### APPLICATION

\*Keeping the predator in our mind the U.S drone we have come up with this idea.

\*This system can apply such as intelligence gathering; battlefield surveillance; border patrol and fishery protection; Recognizance. This article concentrates on aircraft used in those roles; rather than for traffic monitoring; law enforcement; wild life video shoots; and similar activities.

**Project Code: ENGG-06 (Team) (Jr)      Online ID:411**

**Title: ADVANCED NURSE ROBOT**

**Subject Category: Engineering**

**Name: Damini C& Shalini M Std: 8**

**Guide: Jalaluddin Mohd Ansari Shajahan**

**School: Chennai Public School- thirumagizhisai**

#### ABSTRACT:

Nurse robot is mainly designed to help the patients at proper time when required. Our project is mainly focused in timely delivery of medicine to different patients with an accurate response. We programmed the robot's micro-controller using Arduino compiler. This robot is mechanically designed with high degree of freedom and perform various other tasks. This robot comes under category of humanoid.

**Project Code: ENGG-07 (Team)      Online ID:452**

**Title: Women Safety Device**

**Subject Category: Engineering**

**Name: Manasa.S.K& Arpitha.M Std: 9**

**Guide: Sai Venkata Raman**

**School: Atragami Vidya Kendra; Yelahanka; Bangalore**

#### ABSTRACT:

Very recently; a gruesome event involving the harassment of a woman occurred in New Delhi and ultimately led to the woman's death. Similar incidents have also occurred at Pune; Bangalore; and other places across the country. A BBC survey ranked India as one of the most unsafe country for women. This project hopes to put an end to this horror by means of an efficient alert system.

In the light of these events; and in order to make India a safer country for women; I introduce the WSD or Woman's Safety Device. The device is small and portable and easily fits into a

woman's purse or any other handbag. When the woman faces danger all she has to do is throw or vigorously shake the bag containing the device. The device detects the sudden change in vibration and by the means of a microcontroller sends a SMS message to the person's predetermined contacts and the local police station informing them of the exact location of the women. Thus; the police or/and the relatives of the woman can arrive in time to save her. Today; there are many apps in the marketplace that serve the same functions but do so by the means of a phone. But; we know that people in this country seldom purchase phones for battery life rather than functionality. Also; in their hectic lives; people recharge their phones only once every few days .Thus; in times of duress the phone's battery might be dead. The WSD has a battery life of over a month and is simultaneously rigid; compact and highly durable.

**Project Code: ENV-01 (Jr) Online ID:127**

**Title: Forget Watering Your plants-A zero wastage subsoil irrigation system.**

**Subject Category: Environment**

**Name: Vismaya Devasya& Std: 6**

**Guide: Lakshmana**

**School: Kumara Swamy Vidyalaya; Kukke Subramanya; Sullia**

**ABSTRACT:**

Sometimes we lose our loving house plants just by forgetting to water it; or when we have to stay away from home for long. This project is about devising a set up wherein the need for pouring water regularly and directly is eliminated. I have used the property of the water; to rise in narrow spaces without the assistance of external forces which is called 'capillary action'.

A container fitted below the pot serves as water reservoir. A cotton wick runs from the bottom of the pot into the reservoir. Plant receives water continuously which rises by capillary action. Coconut husk or sphagnum moss is placed at the bottom of the pot to hold the moisture. When the pot runs out of water it gives an indication light and an alarming sound to remind for refilling water. With this innovative technique only the least quantity of water is required to raise and maintain the plants. Hence it is a great water saving technique too. Sometimes we see a tray kept under the pot to avoid spilling on the floor and to hold the excess water; which generally goes waste. This project also takes care of this problem that this excess water is reused automatically.

With the success on house plants; I used this technique with suitable modifications to farm irrigation on 'raagi' and 'coconut plant'; which yielded interesting results.

This method of irrigation consumes the least possible water with almost zero wastage thus making it most suitable for draught regions.

**Project Code: ENV-02 Online ID:178**

**Title: Spray from cactus - A threat to flea beetle**

**Subject Category: Environment**

**Name: Anusha K.& Std: 9**

**Guide: Nishitha K. K.**

**School: Indraprastha vidyalaya; uppingangady**

## **ABSTRACT:**

Cactus is a spiny plant which belongs to the family Cactaceae within the order Caryophyllales. They live in dry environment and are usually found in many parts of the world. Our ancestors used cactus for fencing and grew them beside vegetable gardens so as to protect them from enemies. To know the scientific reason behind this I started working on cactus.

## **METHODOLOGY:**

1. Juice of cactus was extracted and three different solutions were prepared.
  - a. Cactus+salt
  - b. Cactus+salt+sodium silicate+oil+water
  - c. Cactus+salt+gum acacia oil+water
2. These solutions were kept for observation along with pure cactus extract to check its shelf life.
3. All solutions were sprayed on cowpea and ladies finger to repel pests.
4. Chemical analysis; pH; conductivity; surface tension; viscosity tests were conducted in SDM College Ujire.
5. Prepared mosquito coil adding cow dung powder; tamarind and fenugreek gum; organic scent or rose water and a small quantity of cactus juice.

## **RESULTS:**

1. Found that cactus spray with sodium silicate has more shelf life comparing to rest of them.
2. The insect flea beetle which attacks cowpea and ladies finger repels when cactus solutions are sprayed on them.
3. Cactus extract contains polyterpenes and phenolic compounds where phenolic compounds respond to insect attack.
4. Mosquitoes repel when cactus mosquito coil is burnt.

Thus cactus insecticide and mosquito coil are natural; cheap; easily available; eco-friendly; non toxic products which can be prepared by the farming community themselves.

**Project Code: ENV-03 (Team)**

**Online ID:198**

**Title: Green Hearth- The best way to reduce the release of Carbon-dioxide into the environment**

**Subject Category: Environment**

**Name: Akshay G. K& Mohammed Tabish Hassan Std: 10**

**Guide: Mrs. Uma R Kaje**

**School: Indraprastha vidyalaya uppinangady;**

## **ABSTRACT:**

Due to the increase in the level of carbon dioxide in the environment; the temperature of the earth has been increased and caused global warming. So; due to the environmental dedication “Green Hearth” is an easy and effective Hearth which helps in decreasing the amount of carbon dioxide to the atmosphere.

## **METHODOLOGY**

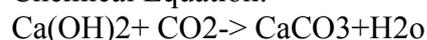
Materials required

- Plywood
- Aluminium pipe

- Cement
- Sand
- Bricks
- Fresh Lime water
- Plastic box
- PVC pipe
- L- bend
- Reducer

Take a plywood of required measurement and upon that with the help of brick; and the mixture of sand and cement in the ratio 5:7 create a hearth. Next; with the help of reducer; fix an aluminium pipe like a chimney. Next; with the help of L- bend fix a PVC pipe like a U-shape the free end of the pipe must be dipped in the fresh lime water.

Chemical Equation:



Calcium Hydroxide + Carbon dioxide gives Calcium Carbonate + Water.

Thus; the collected Calcium Carbonate must be mixed with POP to prepare it as a chalk.

Advantages: This setup can be used in houses; hotels; industries.

Due to the use of the “Green Hearth” the amount of carbon dioxide released to the environment gets decreased and thus the hazards due to the global warming can also be minimised. This Hearth is Pollution free; Safe; Eco-Friendly.

As a future plan; we will implement it in houses; hotels; industries which releases maximum Carbon dioxide from the hearth.

**Project Code: ENV-04 (Team)**

Online ID:241

**Title: silencer which can produce less amount of CO<sub>x</sub> through chemical process(smart silencer)**

**Subject Category: Environment**

**Name: DARSHITA BHANDERI& HITASHA MAKWANA Std: 9**

**Guide: raksha javiya**

**School: K G dholakiya school; Nr: balaji hall; rajkot**

**ABSTRACT:**

Reduce the amount of CO and CO<sub>2</sub> released in the smoke of vehicles as much as possible. Potassium hydroxide absorbs CO and CO<sub>2</sub> to some extent. We prepared a paper like material using paste of potassium hydroxide solution with wastage of used paper. Take 100 gms of potassium hydroxide powder and 100 ml of water. Mix both and make solution. Add wastage papers in the solution and stir to mix well; also amount of papers added maintain practically as our requirement. Thick past made up of above procedure convert into paper like material and dry the papers about two days. Take a cylinder closed with one end and also possible to close other side using proper cap. Diameter and length of cylinder varies as per our requirement. Here we can use 4 to 5 cm and 8 to 10 cm. Cut the paper round shape which we made is used as size of cylinder to put in 3 to 4 cuttings of papers at same distance in it. Close the cylinder and attach with a bike silencer. Collect the PUC data of the bike before attach our cylindrical model and after attach it. Difference in released CO and CO<sub>2</sub> amount with smoke of bike is shown in PUC we have.

**Title: ecofriendly packaging material**  
**Subject Category: Environment**  
**Name: chintan rachh& bhavya rupani Std: 9**  
**Guide: gohil jaynilsinh R**  
**School: K G Dholakiya school**

**ABSTRACT:**

Plastic pollution involves the accumulation of plastic products in the environment that adversely affects wildlife; wildlife habitat; or humans. Many types and forms of plastic pollution exist. Plastic pollution can adversely affect lands; waterways and oceans. Plastic reduction efforts have occurred in some areas in attempts to reduce plastic consumption and promote plastic recycling. The prominence of plastic pollution is correlated with plastics being inexpensive and durable; which leads to high levels of plastics used by humans. Plastics contain many different types of chemicals; depending on the type of plastic. The addition of chemicals is the main reason why these plastics have become so multipurpose; however this has problems associated with it. Some of the chemicals used in plastic production have the potential to be absorbed by human beings through skin absorption. A lot is unknown on how severely humans are physically affected by these chemicals. Some of the chemicals used in plastic production can cause dermatitis upon contact with human skin. In many plastics; these toxic chemicals are only used in trace amounts; but significant testing is often required to ensure that the toxic elements are contained within the plastic by inert material or polymer.

Plastic pollution can also affect humans in which it may create an eyesore that interferes with enjoyment of the natural environment. So; Now we have come up with new project that would totally remove all the harmful effects caused by Normal Plastic and Our Project's Name is Eco-Friendly Packaging Material Bioefplas. The full form of Bioefplas is Bio-Degradable Eco Friendly Plastic.

Objective: Our Objective is to serve our world by providing it a totally Eco Friendly Packaging Material that doesn't harm it. We also want to make this world a greener place to live.

**Materials:**

To make a 100gram of Bioefplas:

Water – 49ml or 49%  
Corn Starch – 45gram or 45%  
Castor Oil – 5ml or 5%  
Food Color – 1ml or 1%  
Total – 100 gram or 100%

**Process:**

First Of all take all the above materials in given amount respectively. Then mix all the materials; a batter would form. Now take a container of a shape in which you want the mould of Bioefplas. Then pour the batter in the Container. The container should be microwave proof and Now; Microwave the batter with the container for 2 minutes and 10 seconds respectively. Your Bioefplas is now ready. It possess most of the properties of plastic.

Comparison:

Normal Plastic:

1. Flexibility – Yes
2. Not-Flammable – No
3. Water Resistance – Yes
4. Electric Resistance – Yes
5. Elasticity – Yes
6. Biodegradable – No

Bioefplas:

1. Flexibility – Yes
2. Not-Flammable – Yes
3. Water Resistance – Yes
4. Electric Resistance – Yes
5. Elasticity – Yes
6. Biodegradable – Yes

Now; You can clearly see that Bioefplas is totally more Eco-Friendly and useful.

Advantages of Bioefplas:

1. It is totally Eco-Friendly.
2. It is Biodegradable.
3. It is not flammable.
4. It possess the capacity of electric resistance.
5. It is elastic if a new proportional amount is been added to it.
6. It is Flexible.

Standard Price of a Plastic Roll: 150 Rs/kg.

Bioefplas Price: 14 Rs/kg

How; Lets Find:

We used 3 materials:

To make 100 grams:

1. Water – 20 paise
2. Castor Oil – 20 paise
3. Corn Starch – 1 Rs

Total – 1.40 Rs

Now we have seen the price factor of 100gm of Bioefplas .Now let's compare 1kg Bioefplas with

1kg Plastic Roll prepared by factories.

$100\text{gm} \times 10 = 1000 \text{ gm or } 1 \text{ kg So;}$

$1.40\text{Rs} \times 10 = 14 \text{ Rs}$

Now; the result is here. So; In the price factor also Bioefplas is having an advantage.

Future Plans:

1. Will try to replace each and every plastic item with Bioefplas.
2. By Suggestion of a Scientist; we are trying to make cups or glasses of Bioefplas.
3. Will conduct some lab experiments.
4. Will Change some of its proportion and try to increase its durability.

Result:

We have successfully created a Bioefplas which possess most of all the properties of plastic and many other properties like Biodegradable and Not – Flammable. And Our Objective to make World a greener place to live have been successfully completed.

**Title: Quest for a Bio-degradable alternative to plastic/wax coating for paper cups**

**Subject Category: Environment**

**Name: Aishwarya Vinod Nambiar & Ram A Mannath Std: 7**

**Guide: Mrs. Sheela K Kunjappan**

**School: SishuGriha Montessori & High School; Bangalore**

**ABSTRACT:**

Use of disposable paper cups for liquids like coffee; tea & beverages; has become the norm. Paper is bio-degradable; but not wax/polyethylene coated paper cups. Disposable paper cups are coated with wax or plastic film; and this makes them non bio-degradable. These cups will take upto 20 years to decompose in a landfill environment. This is the result of wax linings on the inside of the cup. to find a viable biodegradable option for coating to minimize landfill use.

**OUR HYPOTHESES**

1. Find alternatives to replace wax /plastic coatings with a bio-degradable material and that will make disposable paper cups; truly bio-degradable; or
2. Replace plastic paper cups with a bio-degradable alternative.

**EXPERIMENTATION**

1. Alternative coating to wax/plastic
  - a. Guar gum. we sourced Guar gum & made paste. but the paste would not dry; so it could not be used.
  - b. Cellophane. cellophane is bio-degradable & foodgrade. but we could not find a successful method to stick this to paper.
  - c. Bio-plastic. we prepared bioplastic from potato starch & applied to paper. it formed a water proof coating & therefore can be used
2. Using naturally occurring products which are essentially wasted to make cups.
  - a. Sugarcane pulp. crushed sugar cane and used corn starch as a binder. it wasn't smooth
  - b. Peanut shell. crushed peanut shell & used guar gum as binder. It wasn't smooth
  - c. Saw dust. used natural gum as a binder. the finish wasn't smooth; so perhaps we need to source fine sawdust

Full details in file attached

Progress made so far

1. Survey to study perceived needs;
2. Study of Patents granted thus far online;
3. Study of other efforts in this regard online;
4. Visit to paper cup manufacturing facilities to understand how paper cups are made
5. Contacted Hindustan Gum to get sample of Guar Gum for tests
6. Made bioplastic by using Potato Starch
7. Made sample cups using sugarcane pulp; saw dust; peanut shell;

8. Made paper cups and coated it with cellophane; guar gum; bio-plastic (potato starch & corn flour)
9. Activity photographs; scan log book; literature survey – refer file attached

**Project Code: ENV-07 (Team) (Jr) Online ID:342**

**Title: Effects of Segregated Kitchen Wet Waste based Compost on Plant Growth**

**Subject Category: Environment**

**Name: Gautam Dhulipala & Hari Ganesan Std: 6**

**Guide: S.R.Suryanarayanarao**

**School: Sishu Griha Montessori and High School; Bangalore**

**ABSTRACT:**

We segregated the kitchen wet waste into 7 groups; which are by colour – reds; yellows; greens and by type – starch; proteins; flowers. To compare the segregated waste compost; we had a ‘control’ containing all the above kitchen wet waste.

The amount of the waste; additives used were measured and recorded regularly. The resulting organic compost were sieved and weighed before using in the next step.

Next; we grew plants using the compost in various proportions. There were 6 pots consisting of segregated waste compost and 5 pots consisting of mixed waste compost (from control) in various proportions of soil and compost.

We observed that the compost segregated by colour took similar time as the control; while the compost segregated by type took more time than the control.

We also observed that the compost segregated by red colour reduced by weight most; while the control reduced least.

Germination time using control is least; followed by no compost; highest for segregated waste compost. Best growth results was observed with 15 parts mixed waste compost combined with 85 parts soil.

After four months; we felt composting is easy and if all wet waste is composted; our country will have a cleaner environment and the compost can be used to grow crops; trees and plants to India greener.

**Project Code: ENV-08 Online ID:402**

**Title: water car running on fuel cell by salty water**

**Subject Category: Environment**

**Name: sachin kamma & Std: 12**

**Guide: bajranglal soni**

**School: seth sampatramji dugar school**

**ABSTRACT:**

One of the burning problems of the world is depletion of conventional

energy sources and their use has created obstacles to such an alternative in the form of non-conventional energy sources. In this regard, fuel cell is a good and sensitive option for producing continuous energy.

Keeping this in mind, I have made fuel cell from hard water found in the well of Rajasthan. This was made by using resources found in Rajasthan and according to economical condition an inexpensive and easily available electrolyte between the two electrodes. There fore; the fuel cell is made inexpensive and as a result of chemical reaction happening in cell for producing electricity; clean water and heat are produced. thus; we can get rid of some problems.

Not in Rajasthan even in front of the whole world energy problem is growing up as a serious problem. CO<sub>2</sub> National energy storage are to ending & by using these sources also a danger of environmental pollution .

But to fulfill the needs of daily routine work discovery of options is also very necessary.

**Project Code: ENV-09 Online ID:481**

**Title: Banana Leaf Technology**

**Subject Category: Environment**

**Name: M.Tenith Adithyaa& Std: 11**

**Guide: V.Mavel Rajan**

**School: The Hindu Higher Secondary school; Watrap - 626132**

**ABSTRACT:**

A New Invention could save 30 Million Trees  
Leaves can last for a year - A struggle of 3 years

Naturally; Leaves don't stay long they usually become dry within three days. But; this new Technology will preserve the leaves for up to 1 year without using any chemicals. This Technology not only preserve it for longer availability and it also increase its durability; Stretch ability; Resistant to Temperature which no leaves can resist; Weight Holding Capacity and creates the Banana leaf more convenient to make any utilities.

From these processed leaves we can able to make utilities like plates and cups instead of creating Plastic plates and cups. The wide use of plastic material harms our Environment and also the bio-degradable utilities like paper plates and cups make us to cut trees to produce paper. To solve these problems I made a Technology to make the leaves more resistant from drying; we can able to produce many utilities in large scale industrial levels.

The Technology contains no chemicals it is 100 % Eco Friendly. There is no technology for the preservation of Banana leaves for up to 1 year with its green color. These Products are made from Leaves so it does not harm our Environment. This has unique properties; helps Green Revolution and green chemistry by reducing waste generation. The waste which is generated by these products is consumable by animals. From this Technology we can able to reduce 59 % of Plastic and 18 % of Paper Production.

**Project Code: MATHS-01 (Team)** Online ID:432

**Title: A unique solution for car parking problems in metros**

**Subject Category: Maths**

**Name: Ambika Pachaury & Stuti Srivastava Std: 10**

**Guide: Vineeta Aggarwal**

**School: Amity International School; Sector 49; Noida; U.P**

**ABSTRACT:**

India's population is increasing day by day and so are the number of cars on the road. However; the parking area is limited. Increasing it is a difficult job therefore we need to find innovative ways to park cars so that a larger number of cars can be accommodated. Realizing this need; we decided to find an innovative parking system keeping our school's parking and traffic regulation problem in mind. For our project; we took the measurements of our school's and the roads near it's dimensions. We used the trigonometric ratio  $\sin\theta = \frac{\text{perpendicular}}{\text{hypotenuse}}$  in a right angled triangle made in a parking stall to calculate the angle that should be used to construct it. Taking the width of a car to be a constant number which is 11 feet keeping in mind all kinds of cars as well as the aisle length needed to open the doors; the new formula obtained is  $\text{SIN}\theta = \frac{\text{WIDTH OF CAR}}{\text{WIDTH OF CAR PARKING STALL}}$  in which the angle is inversely proportional to the width of stall. Using this; we did some calculations to find the appropriate angle for our school parking system; which have been shown below. We found that although 90 parks maximum number of cars it causes problems in car turning and maneuvering while a 45 angle would park too less cars so we took an urban design manual and keeping in mind the width of the road left for cars to travel which is only 17 ft we concluded that 60 would be the most appropriate angle. Apart from this we also came to realize that one way traffic flow would be better suited for such an area. So we designed one way traffic flow for Amity wherein we enter the school campus from the side road of Noida Expressway and exit from the Amity Chowk.

**Project Code: MATHS-02 (Team) (Jr)** Online ID:435

**Title: USE OF RIGIDITY OF TRIANGLES IN CONSTRUCTION OF BRIDGES**

**Subject Category: Maths**

**Name: SANJANA MALIK & KHUSHI NEHRA Std: 7**

**Guide: S. KAMALAMBAL**

**School: AMITY INTERNATIONAL SCHOOL; SECTOR-44; NOIDA; U.P.**

**ABSTRACT:**

Rigidity is the physical property of being stiff and thereby resisting deformations. Rigid structures are those structures which do not change in shape when subjected to external loads. The property of rigidity is more in triangles than any other polygon; for it is not possible to change the length of a side without changing at least one of the angles; and also it is not possible to change any one the angles without changing the length of one of the sides. Thus; triangles have a great advantage in rigidity. As rigidity is inversely proportional to the angle ( $\text{Rigidity} \propto \frac{1}{\text{angle}}$ ); that is; lesser the angle; the more the rigidity is.

So; our research started at this point and we incorporated this idea in building a model; which shows the transfer of most of the load on the pillar when the moving load is at the center and tries to transfer the load to the earth when the load is at the entry and exit point; through the concept used in cable-stayed bridges.

The efficiency of the bridge is calculated using the formula-

$$\text{Efficiency} = \frac{\text{Weight the bridge can hold}}{\text{Weight of the bridge}}$$

The efficiency can further be increased by lightening the deck and the weight of the cables used.

**Project Code: PHY-01 (Team)**

**Online ID:297**

**Title: ARTIFICIAL INTELLIGENCE ROBOT**

**Subject Category: Physics**

**Name: TIWARI ANKIT RAMKRISHNA & OMKAR BHINGARKAR M**

**Std: 12 SCI-B**

**Guide: HEMANG J. BHATT**

**School: SUNGRACE HIGH SCHOOL; UDHNA**

**ABSTRACT:**

This is artificially made project for benefit for mankind. It is totally eco friendly project. This has been made for benefit for handicapped person; controlling of pollution; solution for traffic rules; accident controller and etc. we had used a different type of programming languages and with the help of atmega 16 ic we had made this project it is a low cost robot and made by elaborate things and our guide mr hemang bhatt sir had given their concept regarding physics to complete this project.

**Project Code: PHY-02 (Team)**

**Online ID:468**

**Title: Owl Inspired Aircraft Wing Design**

**Subject Category: Physics**

**Name: Dhanashri Shelke & Pragati Bhakre Std: 10th std**

**Guide: Ms Amruta Kulkarni**

**School: Hutatma Balvir Shirishkumar Vidyalay; Pune**

**ABSTRACT:**

Owl has a very silent flight. This is helpful for it to catch the prey since prey cannot hear owl coming closer. This gave us an idea; which if blades of aircraft were made inspired by the design as that of the wings of the owl; would it reduce the loud noise? The noise from the aircraft comes from its motor; blades and transmission. In our project; we focused on the noise coming from the blades. There are three major factors in the wings of the owls which give them silent flight – serrations at the back of the wing (trailing edge); smooth velvety surface and porous structure of the wing. Our project was based on the adopting the owl feather design for the blades. The major part of blade noise comes when air comes in contact with trailing edge and forms large flow pattern. The air flow patterns are different around each shape and sizes. We studied four different types of blades by giving two types of serrations on trailing edge and also velvety texture. We have constructed a wind tunnel and recorded the video to see the flow pattern around the blades. These flow pattern changes for the different blade types. We have recorded the noise coming from each of these blade types using collar

microphone. We see that changing the blade surface and edge changes flow patterns and the noise created by wind flow. The noise reduction is more in case of velvety blades than blades with serrations. We further investigated effect of blade surface on noise creation; by sticking sand papers of different roughness onto the blade. We observe that smooth surface makes less noise than rough surface.