# ABSTRACT BOOK

**INDIAN SCIENCE & ENGINEERING FAIR (INSEF)**

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VAGDEVI VILAS INSTITUTIONS

**in association with**

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**Venue: Vagdevi Vilas School, Marathahalli Post, Munekollalu, Bangalore**

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

**INDEX**

**Project Code**:**Bio-01 (Team)** **Online ID:1756**

**Title: Innovative banana cap for delayed or faster ripening**
**Name: Natarajan & Varun Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
Bananas are harvested green and begin ripening as soon as the banana stem is cut from the plant. A banana plant comprises an upright stem/trunk (pseudostem) which can grow up to 6 or 7 meters. Each pseudostem usually produces a single inflorescence (banana bunch). The banana fruits develop from the inflorescence in a cluster (bunch) made up of -hands- with each -hand- having up to 40 fruits. A cluster can have between 3- 20 hands. The individual banana fruits are called -fingers-; so a hand of bananas can have up to 40 fingers (individual fruits). The exposure of hand tips to oxygen would cause intensified production of Gibberellins and Ethylene. Whereas; avoiding the fruit hands to exposure of air will delay the ripening.It is well known that bananas produce ethylene gas; a hormone that triggers ripening. By covering different part of banana bunches and studying the effect would help in understanding the actual part responsible for ripening. But when oxygen availability is cut-off from the hand; fruit and stalk; the ripening process was differently affected. By this research; we would like to identify and display a simple and easy method of increasing banana life and thus help farmers and traders. We would also like to study the role of pheromones in relation with the same project.

**Project Code**:**Bio-02 (Team)** **Online ID:1782**

**Title: ECOLOGICAL EFFECT OF METHYLXANTHINE ALKALOIDS ON SOIL QUALITY AND PLANT GROWTH**
**Name: S. SONIYA & SWETHA S. Std: 11th std**
**Guide: Monika A.M.**
**School: Govt. Jr. College; Gudupalli**

**ABSTRACT:**
It is known that Methylxanthine alkaloids originates from plants; these alkaloids mainly show effect on central nervous system. In this project we studied the ecological effect of Methylxanthine alkaloids on soil quality and plant growth. The main purpose of the project is to find out the impact of Methylxanthine alkaloids on families of selected plant samples Our project involved caffeine estimation in 4different tea and coffee samples and studying their efficacy on plants; pre& post experimental data respect to plant growth were collected;Estimation of reducing sugars (DNSA method); protein (BIURET method) & the soil quality (pH; N; P &K) was carried out. Sample with high caffeine showed increase in plant components; Brand D (Tea) had positive impact on compared othersCurrently we

are carrying experimentation on direct usage of pure form of Methylexanthine alkaloids (Caffeine and Theophylline) on plant growth with three different conc. (0.001m; 0.002m and 0.003m); waiting for the results. Our results will support in understanding the impact of Methylexanthine alkaloids

**Project Code**:**Bio-03 (Team)** **Online ID:1795**

**Title: LOW COST PLANT TISSUE CULTURE MEDIA:**
**Name: shalini raj.g & sushma.k Std: 9**
**Guide: shalini.s**
**School: vagdevi vilas school;varthur**

**ABSTRACT:**
Alovera is succulent has many nutrients:Each leaf is full of a slimy tissue that stores water; which makes the leaves thick.Minerals: calcium; magnesium; phosphorus; sodium; zinc; iron; manganese; potassium; chVitamins: entire B group (including B12 – unique in the world of plants); vitamin C; beta-carotene; choline; and folic acidAmino acids: nine of the ten essential amino acidsUnsaturated fatty acids; Analgesic Substances; Anti-inflammatory substancesAntimicrobial substancesAnthraquinone compoundsEnzymesLignins: their action is associated with excellent penetration abilities of aloe into the tissueSaponins: they work as an astringent; slightly disinfect; and cleanSugars: monosaccharides while combating pathogenic bacteria; fungi; and viruses. It is antibacterial; without simultaneously distorting the balance of the natural bacterial floraPlant tissue culture is a collection of techniques used to maintain or grow plant cells; tissues or organs under sterile conditions on a nutrient culture medium of known composition. The culture media usually contain the following constituents:1. Inorganic nutrients2. Carbon and energy sources3. Organic supplements4. Growth regulators5. Solidifying agents6. pH of mediumAs comparing aloe Vera gel and its property; this can be used as a plant tissue culture media as it has almost all the characteristics and as well as it has some of the advantage like:oLow cost tissue culture mediaoMaintenance is easyoPollution freeoOrganic oSubstitute for hydroponic oPotableoCan be used as Bonsai media Procedure:1. Using the solidifying agent and aloe Vera gel at known quantity plant gel has prepared.2. Gel has poured into a cup and allowed to cool for few minutes3. Monocot (Bajra seeds) and dicot (Meethi seeds) are kept on the top of the aloe gel; allowed for embryo culture for about 15 days.4. Only two drops of water have given in each day. Provided with the indoor environment

**Project Code**:**Bio-04 (Team) (Jr)** **Online ID:1799**

**Title: Micrococcus pigment isolation**
**Name: NAREAN.R & Bharath.M Std: 8th std**
**Guide: Raghu.N**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**
The present project elucidates the culture characterization; isolation and partial purification of novel yellow pigment produced from group of Micrococcus bacterial strains. Growth conditions were optimized during the study. It showed optimum growth at optical density 0.55 at 660nm at 280C (pH7.0 for 48 hours); while the maximum growth and pigment (OD: 0.50 at λ466) production was at 72 h (pH 7). The yellow pigment present in the medium was extracted in methanol; and purified using silica column; and thus produced pigment was characterized using (TLC) thin layer chromatography (2 spots: Rf 0.38 and 0.43); UV-visible and IR spectroscopic techniques; and both spectroscopic profiles showed the characteristic peaks of carotenoid pigment.

**Project Code:Bio-05 (Team)** **Online ID:1804**

**Title: Nucleic Acid Based Rapid on site Malaria Detection from just 5µl of Blood**

**Name: VARUN BHARADWAJ & HARSHA S GOWDA Std: 9TH STD**
**Guide: Raghu.N**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**
Malaria in humans is mainly caused by infection with four Plasmodium species (Plasmodium falciparum; P. vivax; P. ovale; and P. malariae). Malaria affects 300 to 500 million people annually worldwide. Over the past decade; refugee migration; immigration; and international travel have increased significantly worldwide; contributing to an increase of malaria cases in the United States in persons returning from areas where malaria is endemic. Effective treatment of malaria requires precise laboratory diagnosis. P. falciparum; which can be fatal; must be identified promptly and differentiated from the other Plasmodium species that cause malaria. In addition; treatment of P. vivax and P. ovale infections with primaquine to eliminate persistent liver stage is based on results from laboratory examination. Microscopic detection and identification of Plasmodium spp. in Giemsa-stained thick and thin blood smears continues to be the gold standard for the laboratory diagnosis of malaria. PCR is an attractive addition to microscopy for confirmatory identification of Plasmodiumspp. in clinical specimens. Numerous PCR assays have been developed for the laboratory diagnosis of malaria; including conventional and real-time PCR techniques that allow the differentiation of all four species of Plasmodium.

**Project Code:Bio-06 (Team)** **Online ID:1832**

**Title: ìSuperplant Azolla ñ source of vitamin B including rare vitamin B12î**

**Name: Jwala Singh & Neeraj Prabhu Std: 9**
**Guide: Bhavisha Wala**

**School: Vagdevi Vilas School; Varthur; Bangalore**

**ABSTRACT:**
Cyclone garbage separator separates the garbage on the basis of its density. In India; garbage is generally not separated; biodegradable and non-biodegradable materials are thrown together. It is a huge task for Municipal Corporations to segregate the waste. The garbage can be collected in collecting chambers and heated up using sun rays on convex mirrors to dry the waste. This dried waste can be ground into smaller pieces and then passed through the cyclone for separating the low and high density waste. In cyclone garbage separator; a strong wind is blown from the inlet along with the dried waste to create a whirlpool inside the cyclone. High density materials will come out from the lower outlet of the cyclone while low density materials will rise along with the whirlpool and will come out from the upper outlet of the cyclone. Polymer waste is generally very light weight and can be separated by this method.

**Project Code:Bio-07 (Team) (Jr)** **Online ID:1859**

**Title: The cipher data about benefits of green foliage**
**Name: Varshitha M Reddy & Keerthana Murali Std: 8**
**Guide: B Agnes Lily**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**
In the life cycle of all the creatures green plants/trees plays a roll. Because of deforestation area of greenery is getting reduced. Plants consume CO2 for photosynthesis and release out Oxygen. We all know these benefits already. CO2 is one among the greenhouse gases which harm our planet now. So; we thought of calculating how much greenery we need to control this CO2 pollution in our environment.

**Project Code:Bio-08** **Online ID:1876**

**Title: A novel approach in noninvasive Self Diagnosis of Silent Heart attacks using BioElectrics**
**Name: Akash Manoj & X Std: 10th std**
**Guide: Somlatha Manoj**
**School: Hosur**

**ABSTRACT:**
FABP3 is a lightweight protein released quickly from heart muscle into the bloodstream during a heart attack; and therefore; it is an optimal cardiac diagnostic marker. Doctors may test a patient's blood for FABP3 if he or she experiences symptoms. However; silent heart attacks are asymptomatic. Patients often -drop dead- while feeling completely normal. In these cases; doctors are unlikely to administer the crucial FABP3 blood test because there is no visible presentation of symptoms to warrant a diagnosis. As a result; silent heart attacks go unnoticed. If

at-risk patients could test themselves daily for the presence of FABP3 in their blood; they would have higher chances of detecting silent heart attacks as they occur. A method that allows daily self testing would have to be noninvasive; safe; and easy to use. Ultimately; it would have to involve a transcutaneous blood analysis (UV protein quantification). So; I used a model to test whether different magnitudes of charged electricity; when applied to a thin area of skin; would isolate FABP3 from the other blood proteins and attract FABP3 to the capillary walls.

**Project Code:Bio-09** **Online ID:1929**

**Title: Immunizing Brinjal Plants against Leaf Blight Disease Caused by Alternaria solani Using Glycine as Elicitor**

**Name: Prakruthi R U Kumar & X Std: 10**
**Guide: Dr. BS Ravikumar**
**School: Army Public School; Bangalore**

**ABSTRACT:**
A field survey was conducted for collection of leaf blight affected brinjal samples based on characteristic symptoms caused by Alternaria solani. The diseased samples were processed immediately to isolate the associated pathogen by following standard blotter method and agar plating method. The pathogen was identified by morphological; cultural and microscopic characteristics (Mathur and Kongsdal; 2003). The glycine was used as elicitor to study the growth promotion and induction of resistance in brinjal against leaf blight disease causing fungal pathogen A. solani. Among the different concentrations of glycine tested; treatment at 4 mM concentration for three hour duration offered a maximum increase in seed germination (76%) and seedling vigor (1025) compared to other treatments and control. Under greenhouse conditions; significant protection against Alternaria leaf blight disease was recorded by glycine.

**Project Code:CompSc-01 (Team) (Jr)** **Online ID:1669**

**Title: RASPBERRY PI BASED DRIVER ALERTNESS MONITORING AND ALARM SYSTEM**

**Name: Kavya Pandey & Saanvi Bhushan Baari Std: 8**
**Guide: Kamlesh Pandey**
**School: Sishu Griha Montessori & High School; Bangalore**

**ABSTRACT:**
Our project aims at developing a system to alert the drivers from distraction and also monitor and track the data which is retrievable by any one at any time.Based on the data from the public domain; there are as many accidents every day causing serious injuries and deaths due diminishing driver vigilance as in a jumbo jet crash. We designed an application to run on Raspberry Pi kit for detection of face and eyes in the camera captured real time image. The application detects eye-

blink; closed eyes; out-of-sight eyes. It gives an indication of eye blink by means of LED blinking. It gives an alarm when driver's eyes are closed for more than specified duration of time (Driver is feeling drowsy) or when driver is not paying attention to driving (eyes are off the road). The last captured image for which alarm is given is stored in memory. All the events of lapses are recorded with time stamp and stored in file for later use.Materials and Methods:1. RASPBERRY PI 3 kit:Very low cost; credit-card sized computer. 2. Raspberry PI Camera module:High resolution low cost camera to capture real time video. 3. Raspbian: Free operating system optimized for the Raspberry Pi hardware. 4. Python:Widely used high-level programming language. 5. Open CV (Open Source Computer Vision):Library of programming functions

**Project Code:CompSc-02** **Online ID:1747**

**Title: SS4.0 - -AN AID FOR SPEECH IMPAIRMENT-**
**Name: Pranav kalra & X Std: 12**
**Guide: Rajesh Kalra**
**School: Venkateshwar Global School; Rohini; Delhi**

**ABSTRACT:**
Today there are nearly 7.5 million people in the United States only who are suffering from speech impairment. People suffering from speech impairment can be broadly classified into two categories – including people who are suffering from motor paralysis (e.g. Aphasia) and people who suffer from speech impairment [but no motor paralysis ( e.g. Muteness)] . There are various alternative communication measures for the speech impaired people of the category I; but the people suffering from speech impairment of category II don't have accessible AAC devices to solve the problem.SS4.0 is a lightweight; portable; non-bulky and assessable AAC device. SS4.0 facilitates the user to speak through their finger gestures (Can be changed by the user) in 6 different languages; 9 different ascents; various speech rate (80-600 words/minute); where the device learns from the user and gives six most appropriate suggestions. It comes with 500 pre-defined sentences and phrases in an android and IOS apps interfaced with it. The user can power the device using 12v AC adapter; 9v DC battery; 12v solar panel; and standard USB out. The device can give SOS message to 4 people giving their GPS location and tracks user's activities on the internet. SS 4.0 is the world's first AAC technology with a 1.25 seconds pause after the entrance of any value by the user; which makes the device 100% accurate and removes the inaccurate curling of fingers. So; SS4.0 is a device which would make the world more accessible for the speech impaired people.

**Project Code:CompSc-03 (Team) (Jr)** **Online ID:1751**

**Title: Compression and Encryption using Space Curves and Lookup Table**
**Name: Hamsini Ganesan & Pragnya Balijepalli Std: 6**

**Guide: Suryanarayana Rao**
**School: Sishugriha Montessori and High School; Bangalore**

**ABSTRACT:**
Our project is aimed at creating methods for sending English text messages in a secret way. The compression and encryption is done in such a way that genuine receiver is able to decode the message and for anybody else it is a random text.Our school guide gave us the problem of compressing text messages so that money can be saved while sending SMS or whatsup messages. We got motivation from Caesar's box code to use grid as a method of encryption. Then we extended that method to use space curves as encoding method. We created many space curves ourselves by imitating the principles of Rangoli . We calculated the savings for different messages taken from SMS and Whatsup messages. We built paper model for method 1 for demonstration.Since it was difficult to send more than one or two messages in one grid; our guide suggested to try lookup table based compression. In the second method; a lookup table of small size is used and this is filled with most frequently used words. We first built 10x10 table and then later extended that to 16x16 table. We sent the indices of the table entries instead of the actual words to get both encryption and compression at the same time.We took help from Mr. Vishnu; who helped us to program this using Arduino and GSM module which can send and receive SMS message. We used this to collect more data on the compression and savings in space.

**Project Code:Energy-01 (Team)** **Online ID:1781**

**Title: Increasing the yield of biofuel production from the combination of Nerium oleander l; Euphorbia neriifolia; Lantana camera & Brassica oleracea**
**Name: CHAITANYA PRAVEENA S & BHOOMIKA N Std: 9**
**Guide: Monika A.M.**
**School: A.P. Model School; Gudupalli.**

**ABSTRACT:**
The principle fuel used as a petroleum substitute is bioethanol. It can be produced by the sugar fermentation process. In this project we produced bioethanol from 2 different flower and 2 leaves samples. Our project mainly focuses on increasing the yield of bioethanol production by using combinations of samples. The project involves extraction of plant samples using mixer; sterilization of sample; arranging fermentation setup; estimation of before and after fermentation broth reducing sugar level; extraction of ethanol by distillation process and estimation of ethanol by using potassium dichromate oxidation method. By comparing the results with control (single sample); the four combinations and most two combinations has been produced higher quantity of ethanol. So finally our conclusion was by comparing single source of bioethanol yield combinations of sources will produce high yield of bioethanol. Not only had that during estimation little high quality of

ethanol has been produced.

**Project Code:Energy-02 (Team)** **Online ID:1784**

**Title: REPROCESS OF ABHISHEKAM WASTE FROM TEMPLES IN PRODUCTION OF BIODIESEL**

**Name: JEEVITHA N. & ROSHINI A. Std: 10th std**
**Guide: Dr. M. D. MAHADEV**
**School: ZPHS; Chinnagollapalli**

**ABSTRACT:**
The goal of the research is to produce the Biofuel from the abhishekam conducted by priests; by pouring libations on the image of the deity being worshipped. The reason of study is due to large amount of nutritious food; fruits deity in water; milk; honey; ghee; fruit juice; Panchamritam (Five-in-one nectar); coconut water; sugar and other liquids and solids and dairy products being wasted and drained away in almost all the temples in India and stored in small pit ultimately this stagnant water undergo spoilage and fermentation which leads to bad odor. Hence considering this; our project involved in collection of samples and addition of alpha amylase which helps in breakdown of substances in to simple molecules and yeast (Saccharomyces cerevisiea) helps in fermentation producing ethanol and water. The fermented samples undertaken to distillation process; the distillate then estimated ethanol percentage which contain combustion property and the sugar levels were checked which found to be less after fermentation. The projects also involved in the separation of lipds/fats from the sample. The overall aim is to produce and strengthen ecofriendly biofuel to replace the conventional fossil fuel derived petroleum in meeting the demand of fuels due to rapid industrialization and rise in population.

**Project Code:Energy-03** **Online ID:1836**

**Title: Increasing output power of the solar model**

**Name: AHEESH SN & X Std: 9**
**Guide: BHANU PRIYA**
**School: Sudarshan Vidya Mandir; Jayanagar; Bengaluru**

**ABSTRACT:**
A solar model with reflectors is designed; such that the amount of light falling on the solar cell increases; so the output voltage is also increased.different size and designs of reflectors were tried. The reflector was adjusted to different angles and the readings were noted. The output voltage was maximum at certain angle between the solar cell and the reflector.

**Project Code:Engg-01 (Jr)** **Online ID:1695**

**Title: SOLAR HIGHWAY LIGHTING SYSTEM WITH AUTO TURN OFF ON DAY TIME**

**Name: Hari shri.S & X Std: 7**
**Guide: sarita.B**
**School: Vagdevi Vilas school; marathahalli;Bangalore**

**ABSTRACT:**
Automatic Street Light Control System is a simple yet powerful concept; which uses transistor as a switch. By using this system manual works are 100% removed. It automatically switches ON lights when the sunlight goes below the visible region of our eyes. This is done by a sensor called Light Dependant Resistor (LDR) which senses the light actually like our eyes. It automatically switches OFF lights whenever the sunlight comes; visible to our eyes.By using this system energy consumption is also reduced because nowadays the manually operated street lights are not switched off even the sunlight comes and also switched on earlier before sunset. In this project; no need of manual operation like ON time and OFF time setting.LDR and transistor are the main components of the project. The resistance of light dependant resistor (LDR) varies according to the light falling on it. This LDR is connected as biasing resistor of the transistor. According to the light falls on the LDR; the transistor is operated in saturation and cut off region. This transistor switches the relay to switch on / off the light.A crystal based solar panel is used to charge a rechargeable battery of 6V. LED based lighting is arranged in this project for energy saving application. Additional battery charger circuit is provided for emergency applications. This charger uses regulated 6V; 750mA power supply. 7806 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/18V step down transformer.

**Project Code:Engg-02 (Team) (Jr)** **Online ID:1698**

**Title: AERO DYNAMIC WIND MILL WITH REVERSE CHARGE PROTECTION FOR RURAL POWER GENERATION APPLICATIONS**

**Name: rakesh reddy.B & Shubam MS Std: 7**
**Guide: sarita.B**
**School: Vagdevi Vilas school; marathahalli;Bangalore**

**ABSTRACT:**
AERO DYNAMIC WIND MILL WITH REVERSE CHARGE PROTECTION FOR RURAL POWER GENERATION APPLICATIONSABSTRACT:Energy is a major input for overall socio-economic development of any society. Wind energy is the fastest growing renewable energy. From centuries man has been trying to convert wind power to mechanical &; more recently; electric power. Wind technology has improved significantly over the past two decades; and wind energy

has become increasingly competitive with other power generation options. Wind power has negligible fuel costs. A key challenge for wind energy is that electricity production depends on when winds blow rather than when consumers need power. The amount of electricity generated from wind has been growing rapidly in recent years. The power in the wind can be computed by using the concepts of kinetics. The wind mill works on the principle of converting kinetic energy of the wind to mechanical energy. The power available in the wind increases rapidly with the speed hence wind energy conversion machines should be located preferable in areas where the winds are strong & persistent.This project is designed by using an aero dynamic wind blade arrangement which is connected to the shaft of the dc geared motor such that its output is given to the Reverse polarity preventer cum polarity corrector. Depending upon the movement of the wind blade (clock wise / anti clock wise) the polarity can be corrected automatically which is given as an input supply to the 12V DC rechargeable battery. The o/p of this lead acid battery is given as input to the inverter which drives the AC loads. The battery is connected to the inverter. This inverter is used to convert the 12 Volt D.C to the 230 Volt A.C. This 230 Volt A.C voltage is used to activate the loads. Here we are also using Conventional Battery Charger Unit to recharge the battery.The output of wind turbine is given to 12V 1.3 Amp-Hour Lead-acid Battery. The battery is connected to the inverter which is used to convert the D.C 12 Volt to the 230 Volt A.C. By increasing the capacity of battery and inverter circuit; the power rating is increased

**Project Code**:**Engg-03 (Team) (Jr)** **Online ID:1720**

**Title: Automatic shoes**
**Name: AMULYA V & DEEPTHI B Std: 8**
**Guide: SRINIDHI C M**
**School: VAGDEVI VILAS SCHOOL BIDADI**

**ABSTRACT:**
The project involves the development of a light strap which can be attached to the footwear so that one can easily wade through darkness with the help of light emitted from the shoes. This enables the user to keep his hands free to do other work such as holding onto something. The project requires a plastic tape which is mounted with small LED bulbs. These bulbs are connected with a small battery also located on the belt. This device can be very useful while trekking and walking in dark areas

**Project Code**:**Engg-04 (Team)** **Online ID:1725**

**Title: High Sensitive Low Power Electronic Ear**
**Name: Srinivas .T & Pushpak Std: 10**
**Guide: sarita.B**
**School: Vagdevi Vilas school; bidadi;Bangalore**

**ABSTRACT:**
Normally; hearing aid circuits consume battery power continuously once they are switched on. This project is designed to save battery power by switching on the sound amplifier section only when sound is detected. The sensitivity of the detection section and the 'on' time duration of the sound amplifier circuit can be set by the user. Also the circuit uses only a single condenser mic for sound detection and amplification. This hearing aid project consists of a condenser microphone; earphone; and sound detection and amplification sections. The sound signal received at the mic is pre-amplified by transistor BC549. The preset is also used to control the sensitivity of the sound signals received by the circuit. The sound amplifier is designed using NPN transistors. The sound signal received from the mic is fed to amplifier which is wired in unity follower configuration. The unity follower mode resolves the problem of impedance mismatch which would have occurred if the output of the mic is fed directly to amplifier stage. The output is fed to the base of transistor. The weak signal received at transistor is further amplified by another stage of amplifiers. An earphone to listen to the sound is connected at the output. With 9V DC supply; when sound is detected through the mic; the amplifier section is automatically triggered and the current consumption of the circuit is about 96 mA. When the amplifier circuit is 'off;' the circuit draws a current of about 6 mA only; thus saving considerable amount of battery power.

## Project Code:Engg-05 (Team) Online ID:1758

**Title: Innovative portable glass cleaner with movable cleaning brushes**
**Name: Sanjith & Rohit pandiyan Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
On a common fixed shaft; a set of six bottle cleaning brushes are arranged on each side. These brushes can roll like rollers while the liquid soap slowly oozes out of the common shaft. The liquid soap seepage can be controlled by pressing the button near the handle which is attached to a piston like arrangement. The shaft is fixed into the handle by screw and groove arrangement.

## Project Code:Engg-06 Online ID:1768

**Title: Smart bike which ensures bikers safety**
**Name: Rohith & X Std: 10**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
Very often; the bikers ride their bikes without helmets which might claim their lives due to accidental head injuries. The present research product deals with a

smart sensor which recognises the biker only if he puts on his helmet completing the circuit. Without helmet on head; the circuit is incomplete or open. The sensor system provides a safe system for bikers and ensures they wear the helmet and drive thus ensures the safety of bikers.

## Project Code:Engg-07 (Jr) Online ID:1797

**Title: Remote Control Car**
**Name: Shankar Narain Subramaniam & X Std: 6**
**Guide: Tarun Choubisa**
**School: Silver Oaks International; Dommasandra; Bangalore**

**ABSTRACT:**
My RC car was a pain-sticking work of three years. I started off with a prototype Lego model of the car. It was a simple model which had no remote; the wheels rotate when you connect the power. In this model I used materials like Lego blocks; an old gear box connected to a wheel and a motor. So when you power the motor the spindle turns the gears and the gears in turn turns the wheels. There is no way you can control this model manually.After this model I continued on to my next model. In this model I worked with slightly complex materials. Now I was working on my real goal which I set- RC Car. I worked with PCBs (Printed Circuit Boards); tactile switches; powerful motors; copper boards to mount a few of my PCBs. As I was attaching new parts in my project I learnt about the working principle about each component and the RC car as a whole. I learnt that when you press one tactile switch; an electric pulse is sent to an encoder. This encoder converts these electric pulses into binary bits. This is then sent to the car module through RF (Radio frequency) signals. These binary bits; once received by the car; are converted back to electrical pulses by a decoder. These electrical pulses are then sent to motor driver. This driver interprets the electrical signals-whether it's forward; backward; left or right. This interpreted signal is sent to the motors causing the car the move the direction commanded by the controller.

## Project Code:Engg-08 (Team) Online ID:1808

**Title: ultimate power gloze**
**Name: Rakesh.v & k.Hithesh gowda Std: 10**
**Guide: shalini.s**
**School: vagdevi vilas school;bidadi**

**ABSTRACT:**
Introduction:We observed in our locality that the problems caused during •Cleaning glass window.•Cleaning board in our school.•Cleaning home appliances like TV; etc.So we developed this model[ultimate power gloze] where it controls skin problems caused by dust & sop materials like colin and other glass cleaning products; & also to avoid breathing problem caused by chalk piece powder while erasing board and dusting the duster. One major specialty of this gloze is that

nothing can be wasted & and we can also collect and reuse it.

**Project Code**:**Engg-09 (Team) (Jr)** **Online ID:1813**

**Title: Smart Hat**
**Name: Aishwarya N Murthy & Brunda B Std: 7**
**Guide: Y V Rajyalakshmi**
**School: Vagdevi Vilas School;Marathahalli**

**ABSTRACT:**
The plan is to launch the product with initial aim of targeting police and tourism industry. This could initially drive the volumes and can look at additional markets like apartment security; personal security (women & children); as tool during conferences; conventions; gift article during functions; workshops etc. Tourism and police applications are amenable and require minimum marketing and tie with existing players will allow us to market easily. The proposed product will look like an ordinary hat; capable of both video recording and capturing pictures ; works both as standalone and as a part controlled by mobile phone (using our app). The electronics containing Bluetooth module; basic circuitry; battery will be located in the "brim" of the hat; which is detachable from the hat. The camera can be enclosed in the brim itself and the whole hat apart from brim is washable. From an app we can live stream and control and also we have planned to install a GPS module; which gives the location and based on the location; user can get the details of places around him which can all be done using our app.

## Project Code:Engg-10 (Team) (Jr) Online ID:1852

**Title: Radiation detecting mobile case**
**Name: Praveen kumar & Siddhant Mishra Std: 8**
**Guide: Y V Rajyalakshmi**
**School: Vagdevi Vilas School;Marathahalli**

**ABSTRACT:**
Due to high radiation many people get affected. This project indicates when there is high radiation around the user; therefor this will prevent diseases.We attached an ionization chamber to a mobile case which will detect when there is high radiation. This case will give a green light when there is low radiation; and gives an orange light when here is medium to high radiation and gives a red when there is very high radiation; when the user doesn't go away from the radiated place within 30 seconds the case will gives an alarm.

## Project Code:Engg-11 Online ID:1881

**Title: BIO CEILINGS ñ A NOVEL APPROACH**
**Name: Thejas K. V. & X Std: 12**
**Guide: Rashmi R.**
**School: Christ Junior College; Bengaluru**

**ABSTRACT:**
The project aims to develop a false ceiling material using a composite of sugarcane (Saccharum officinarum) bagasse and corn cob (Zea mays) with natural resins as adhesives contributing for the cause of greener and sustainable environment. Numerous research on sugarcane bagasse(SCB) and corncob reveals that they can be a substitute for the raw materials used in Infrastructural manufacturing as it is eco-friendly and cost effective. Our focus is on preparing the composite of the duo and study their properties. The steamed corn cob slices and SCB fibers were powdered after drying; mixed in different ratio using resin from Araucaria cunninghamii as adhesive to overcome the drawbacks of a synthetic adhesive. The samples were tested for sound absorption; mechanical strength and thermal insulation. The results so obtained were positive and showed that a composite of SCB and CC could be used in the manufacture of low cost false ceiling material which could also show a better performance in sound absorption and thermal insulation. We are further exploring the possibility of it being used in packing industry as a substitute for synthetic packing materials.

**Project Code:Env-01 (Team) (Jr)** **Online ID:1643**

**Title: COMPARATIVE STUDY AND DEVELOPMENT OF INNOVATIVE AND NON-CHEMICAL METHODS OF ENHANCING SHELF LIFE OF RIPENED BANANAS**

**Name: Pragun Pudukoli & Shruti Karthik Std: 6**
**Guide: Suryanarayanarao.S.R**
**School: Sishu Griha Montessori and High School; Bangalore**

**ABSTRACT:**
Our project aims at increasing the shelf life of ripened bananas by exploring different ways of storing and recommend the most effective method.Genesis of the idea: Many a time; we found bananas getting wasted as they turn black within a short duration of 2-3 days depending on the weather. This causes a huge wastage as the fruit is non-seasonal and low cost. This is the prime mover for taking up the project.Methodology and Experimentation:A specific variety of Bananas was chosen for the experiment. Shelf life was measured by storing it in different environmental conditions given below: Normal Environment Normal Environment with Cling wrapped Stem Water Pyramid Vacuum container Vacuum container in Refrigerator Earthen pot with garlic & onion peelMiscellaneous methods using turmeric; wrapping with different papers etc.Zeer pot with water absorbing foamMaterials used: Bananas; Vacuum containers; weighing scale; measuring jar;cling film; fabricated pyramid; earthen pots; garlic and onion peels etc. Result/Observation/Findings:Most promising method of enhancing shelf life based on the experimental observations is storing bananas in vacuum container placed in refrigerator. This proved a shelf life of 9-10 days. We are also in the process of exploring use of zeer pot with water absorbing foam to reach out economically lower section of the society.Future Plans:1.Experimenting with zeer pot with water absorbing foam2.Protein analysis of most promising method 3.Customer survey of final recommended storage system

**Project Code:Env-02** **Online ID:1755**

**Title: A comparative study of milk nutrients from different varieties of cows and effect on the consumers**

**Name: Tarun.A & X Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
The current research project is based on the observations made in our colony in day to day lives. We intend to research if there is any difference or variation in the nutrient content of milk drawn from cows of different breeds (local and hybrid cows). Our study will be extended to identify if the health of consumers is affected by the milk from these cows.Our own colony is chosen as study area as we have many farmers with cows and they supply milk to the colony residents.The

comparative study and nutrient analysis of various milk samples provide us with the research study which helps us conclude the following points (based on study):1.The nutrient analysis values of various milk samples proves that:2.The comparative study of different varieties of cows shows that:3.The water consumed by cows from different sources suggest that:

**Project Code:Env-03 (Team)** **Online ID:1757**

**Title: Effective homemade water filter cum storage unit with oligodynamic effect**
**Name: Prajaktha & Samriddhi Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
RO (Reverse Osmosis) subjected water; being essentially mineral-free; tends to dissolve substances with which it is in contact. Notably; carbon dioxide from the air is rapidly absorbed; making the water acidic and even more aggressive. Many minerals in our body are dissolved by RO water. Consumers spill huge amounts of calcium; magnesium and other trace minerals into the urine. The more mineral loss; the greater the risk for osteoporosis; osteoarthritis; hypothyroidism; coronary artery disease; high blood pressure and a long list of degenerative diseases generally associated with premature aging.

**Project Code:Env-04** **Online ID:1759**

**Title: Magic liquid ñ wax free apples instantly**
**Name: Adithya Singh & X Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
As wax/Paraffin is hydrophobic in nature; paraffin would require a lipophilic solvent; hence mixture of various non- toxic; non-polar alkanes; Methylated Spirits; Distilled Mineral Spirits; would dissolve the wax molecules. Saline solution would help in precipitating the salts.

**Project Code:Env-05 (Team)** **Online ID:1766**

**Title: Carcinogens clearing darbha grass mat for car seat covers**
**Name: Ruthvik & Vivekananda Std: 9**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
Air inside the car parked in hot sun also gets heated up; which radiates to the dye on fabric/ leather/leather like material. X-Rays are ionizing radiation i.e. radiation that carries enough energy to free electrons from atoms or molecules; thereby ionizing organic matter causing changes in the molecular structure. The benzidine-based aromatic amines of dye due to X-Rays ; heating and high pressure undergo some structural changes causing excitation of few aromatic compounds which escape into the air in the form of vapours from fixative in the dye. These escaped aromatic molecules gives out a suffocating smell which sometimes causes dizziness and nausea in a person who just sits in the car with warm air. Continuous exposure to such vapours might cause various cancers as these molecules are highly carcinogenic. Traditional tropical grass; Darbha is used in the form of a mat to absorb the aromatic amines and also the ionising radiation; X rays which are responsible for formation of carcinogenic molecules. Electron microscopy of different grasses revealed stunning nano-patterns and hierarchical nano or micro structures in darbha grass which could trap the aromatic ring structures present in warm air in the vapour forms. Chemical dyes on a finished fabric/leather/leather like materials are chemically stable. They consist of benzidine-based aromatic amines which on exposure to X-rays; high temperature and pressure undergo structural changes getting modified to highly carcinogenic vapours. These warm vapours; when breathed in; by a person /pet getting into the car with closed windows are highly prone to cancers.

**Project Code:Env-06 (Team)** **Online ID:1767**

**Title: Protein mix for intensified vermicomposting**

**Name: Sahana & Tejaswini Std: 10**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
Given the right environment; the red worms will digest the kitchen scraps and bedding faster than any other waste like dry leaf waste /paper waste. The kitchen waste will pass through the worms' bodies and become -castings.- In about 3-4 months; the worms will have digested nearly all the garbage and bedding and the bin will be filled with a rich; black natural fertilizer and soil amendment. Comparatively; the paper waste and dry leaf waste would require more time to be composted by red worms. Adding the agriculture waste like leguminous plants; husk and coat waste of grains in powdered form to the initial stages would intensify the composting process. We intend to identify the perfect ratio at which the waste is degraded within two months.

**Project Code:Env-07 (Team) (Jr)** **Online ID:1800**

**Title: Biogreen**

**Name: Bhavana.G.S & Purvika.K.S Std: 9th Std**
**Guide: Raghu.N**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**
BioGreen is made up of 3 different bacterium called Micrococcus; Acenitobacter and bacillus subtilis when applied in the soil it solubilizes zinc and makes it available to the plants. It also solubilizes insoluble phosphorous and makes it available to the plants. BioGreen provides zinc and phosphorous to the plant; Stimulates plant growth; Activates soil biologically. Different concentration of Dosage: Seed treatment -50; 100; 150; 200 and 250 ml for seeds in one acre; Root dipping - 100; 200; 300; 400 and 500 ml for seedlings for one acre; Soil application: 1-2 liters is mixed with 25 kgs of powdered FYM and broadcasted before planting/transplanting; Soil drenching: 2 liters mixed with water at 0.5% concentration and applied to root zone. Green Dual effectively controls several soil borne fungi. It also serves as a phosphate solubilizing bacteria in neutral to alkaline soils. It is also reported to control nematodes. Hence more suited for soil application.

## Project Code:Env-08 (Team) (Jr) Online ID:1802

**Title: Biodegradation of used lubricating and diesel oils by a new yeast strain Candida Viswanathii KA-2011**
**Name: Keerthana & Varshitha.M Std: 8th Std**
**Guide: Raghu.N**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**
Disposal of the automotive lubricating oil after usage can cause environmentalhazards. This study aimed to isolate a microbial isolate is that able to biodegradelubricating oil effectively. A new yeast strain; identified Candida viswanathii KA-2011; has showed high biodegradation efficiency for different used lubricating oils.Capability of this isolate to degrade different high and low molecular weighthydrocarbons; castor oil; diesel oil and grease was tested. It showed highdegradation efficiency for most of the tested compounds. The biodegradationefficiency under high osmotic pressure was studied. It effectively biodegradelubricating and diesel oils (58.6 and 93.9%; respectively) at 6% salt concentrationafter four days only. C. viswanathii KA-2011 can be effectively used for removalof lubricants; diesel or vegetative oils pollution from soil; wastewater and seawater. Use of C. viswanathii KA-2011 in the bioremediation of lubricant orgasoline contaminated sea-water save the aquaculture from these pollutants; aswell as it open new horizons in using of contaminated soil and wastewater inagriculture.

## Project Code:Env-09 Online ID:1824

**Title: A New Approach to Monitoring Lakes in Developing Countries ñ Crowdsourcing Environmental Science**

**Name: Sahithi Rohini Pingali & X Std: 11**
**Guide: Mary Raj**
**School: Inventure Academy; Bangalore**

**ABSTRACT:**
In order to revive the many lakes in developing countries suffering from water pollution; it is vital that up-to-date scientific data about them is available. Unfortunately such data; and public awareness of the lakes' plight; are lacking. This project aims to tackle these problems by developing a system to enable the crowdsourcing of lake monitoring to schools and other interested organizations. We carried out systematic water testing on a lake in Bangalore; India; which showed that in the short period of three months there was double digit percentage change in several physical and chemical lake parameters that were approaching and/or exceeding the permissible limits. This confirmed that regular lake monitoring would provide valuable insights to researchers and governments agencies. To make lake water testing easier for non-experts; we developed a unique and frugal lake test kit. The kit consists of an integrated mobile phone app; an electronic sensing device and chemical test strips. The mobile app uses Bluetooth to automatically detect all data collected by the electronic sensors. A color calibration and recognition module in the app is used to capture the color change in a test strip; and maps it to the corresponding contaminant concentration level. The app also allows the user to capture pictures and information about birds; plants; and other bioindicators; as well as sewage or trash being dumped into lakes. It uploads all the data collected to a public cloud platform; where we have provided analysis and visualization modules to help users obtain valuable insights. After creating this end-to-end integrated electronic cloud-based system we successfully applied it to monitor the relative pollution levels and temporal changes in four different Bangalore lakes.

**Project Code:Env-10 (Team) (Jr)** **Online ID:1866**

**Title: Simple and safe homemade dengue mosquito eradicator**

**Name: Suhas & Darshan Std: 7**
**Guide: Anitha Sukhdev**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
The dried papaya leaves are powdered and mixed with neem oil and left for a week in a closed glass bottle. The oil after incubation for a week is dispensed in small containers and used. Few drops of this oil are added while making paper. The homemade paper is dried and used as effective mosquito repellent on lighting. The paper as it burns slowly; releases the alkaloids in oil traces in paper and gets diffused and help in eradicating mosquitoes. The papaya leaf extract is bacterial

insecticide; spinosad on larvicidal and has pupicidal activity against the chikungunya vector; Aedes aegypti.

## Project Code:Maths-01 Online ID:1632

**Title: Deterministic Water Stress Model For Bangalore Urban Area**
**Name: Varun Srinivasa Murthy & X Std: 12**
**Guide: Dr. Shailaja D. Sharma**
**School: Mallya Aditi International School; Bangalore**

**ABSTRACT:**
In the past decade; increases in urbanization and consumerism have dramatically altered the urban water balance and century-old natural groundwater framework in the major metropolises in India. When an accelerating increase in consumption is not counteracted by a similar rate of replenishment; the resulting imbalance will grow over time that may permanently destabilize the urban water cycle. In this project; we understand the nature of this developing water stress within the city of Bangalore; and develop a simple computational framework (deterministic mathematical model) using important concepts from statistics and differential equations. Bangalore urban area has been taken as the geographic boundary of the study. The study concerns the availability of water for domestic consumption in the urban area; in the context of increasing demand; increasing ground water depletion; increased over-land transfers of water from the urban hinterland to the urban areas; and increased energy intensity of water supply. In view of the number and complexity of the variables involved; and in view of the availability of data; we select a sub-set of the parameters to focus upon and model water stress as a constraining factor that will over time limit urban population growth. All computational analysis was carried out using Microsoft Excel. Python and R were used for confirmatory analysis. This paper proposes a simple and easy-to-understand relationship between water supply and demand to reasonably predict the timing of the water stress event.

## Project Code:Maths-02 Online ID:1664

**Title: Math is Interesting !!! - Beauty of numbers in life aspects - A novel approach.**
**Name: SEBASTIAN THOMAS & X Std: 12**
**Guide: X**
**School: CHRIST JUNIOR COLLEGE**

**ABSTRACT:**
INSEF REGIONAL FAIR – SYNOPSIS Title: MATH IS INTERESTING! - BEAUTY OF NUMBERS IN LIFE ASPECTS - A NOVEL APPROACHAim: a) To prove the new number theory concept - LIMIT OF EXTENSION- theorem and to determine the application of number system in fields like conservation theory; chemistry periodic table; mathematics and

molecular DNA - Genetics. b) To make people understand these concepts using numbers in an easier way through survey analysis.The research work has found a novel discovery in mathematics of finding the limit up to which a number can be expressed as sum of squares or cubes using Euclid's division lemma and Masahiko – Fujiwara's Theorem(MFT) in a different way. 125 is the unique "Angel number" which can be expressed as sum of two squares in two ways. The factors of 125 are 1;125;5 and 25. When the factor 25 is taken and by applying MFT : 25 x 52 = 1300 => 36^2 + 2^2. Also; applying MFT for 36 we get: 36x63 = 2268. When 2268 is divided by the original number 125 we get the same quotient and remainder (18).The same concept holds good for other factors. The conclusion; is that we can get to know the limit up to which a number can be expressed as sum of squares or cubes – a Novel discovery. Apart from 125 ; this concept holds good for 1241 and 1717.Thus the - LIMIT OF EXTENSION- theorem is proved.While applying Mathematics in these fields ; cubic numbers are used. Here the difference between two successive cubic numbers is obtained. The digits are multiplied and then divided by 7; such that the resultant number belongs to {N}. 250 pairs of cubic numbers were considered. Different base pairs like 58; 28;10;4 were taken. For 58 base pairs; 29 of numbers were exactly divisible by 7 while rest of them were not divisible by 7. The same thing holds good for other pairs.A person climbs up a staircase of 28 steps. While climbing 14 steps; the kinetic energy is lost. But as he descends 14 steps; he has gained kinetic energy . The following results have been proved using graphical analysis. So; through base pair theorem;"Energy lost = Energy Gained in an isolated system" was proved. The results are depicted using graphical analysis by calculating slope.The same mathematical concept obeys Chargaff's rule - - Amount of purines( Adenine + Guanine) is equal to amount of pyrimidine( Thymine + Cytosine) for organisms-. When DNA of required number of strands is taken; even though the number of A - T and G - C sequences were neither the same nor in sequential order; the purine amount was equal to pyrimidine amount - a Novel approach. Thus ;Chargaff's law is proved using numbers. The results are tabulated.Moseley Law states - -Properties of elements are functions of atomic number-. Here the difference of successive cubic numbers is divided by 19. It was found that the numbers exactly divisible by 19 always occurred at every 12th and 7th position of the cubic number chain; which is unique. After dividing by 19; the digits of quotient are added to give 10;19;25.... representing atomic number. Thus ; various pairs of elements resembled in different chemical properties .Application: The research concepts were explained to the students of - The Samhita Academy- to understand the survey analysis. The graphs were plotted and compared. There was a positive result where the rates of people's interest towards math; before taking the session was found to be 2201 and after the session it was 2619.4. Through this; we find that students' interest towards math has enhanced from this concept and can be easily applied in our educational systems to make student's study more simpler.Cost - Effectiveness: This project is extremely cost effective it's a novel way of applying math in

various fields.Scope: Conducting research to study the various combination of numbers in Astrophysics( Constellation patterns) and coding sequences for different studies.

**Project Code:Maths-03 (Team)** **Online ID:1684**

**Title: Pattern in GCF**
**Name: P. Balaramakrishna Varma & R. Nirban Kumar Std: 9**
**Guide: Sindhu R**
**School: Vagdevi Vilas School; Varthur; Bangalore**

**ABSTRACT:**
In this project; an alternate method to find greatest common factor of any two numbers is being investigated. When we tabulate greatest common factors of consecutive numbers in a table; it is found that a string of length equal to the smaller number will repeat itself infinitely. This observation can be used to find greatest common factor of any two numbers by knowing the position of the greater number. The table below shows the greatest common factors of consecutive numbers. The repeating strings are marked at their end points in each row. Example: For number 6; string "1;2;3;2;1;6" will repeat itself infinitely as GCF of 6 and all consecutive numbers starting from 1. To find GCF of 6 and 77;77;77;773; we can simply find position of greater number on the string "1;2;3;2;1;6" to find their GCF . Here number 77;77;77;773 takes 5th position on the string and hence GCF of 77;77;77;773 and 6 can be concluded as 1.

**Project Code:Maths-04 (Team)** **Online ID:1699**

**Title: To disprove algebraic identity through equality**
**Name: Kushal kumar M & Balaram krishana varma Std: 9**
**Guide: Upendra Rao**
**School: Vagdevi vilas school varthur**

**ABSTRACT:**
(a-b+c) whole square on expansion is equal to the (-a+b-c) whole square on expansion but the when they are squared on their LHS of the both square they are not equal. only they are equal when the equality condition b=a+c. hence the equality condition checks the certain values of evaluation and then finally concluded that LHS of both the equation are equal only when they are b=a+c.

**Project Code:Maths-05 (Jr)** **Online ID:1883**

**Title: Analysing various sub-stages of solving Rubicks Cube**
**Name: Nikhil N Iyer & X Std: 8**
**Guide: Self guided**
**School: Twinklers School; Bangalore**

**ABSTRACT:**

Analysing various sub-stages of solving Rubicks CubeObjective:1. My objective is to find where and why; time is lost while solving rubicks cube in different algorithms.2. Recommend a path to solve different stages of a Rubiks cube optimally.Introduction:i have been solving rubicks cube for many years. i started wondering; why certain methods take shorter time than others.This project tries to reason out the same.Method:i took a known scrambled cube and solved using different algorithms.Algorithm here; is defined as moves you take;to go to the next stage;based on the existing pattern and apply this iteratively.A cube is solved in various stages-In a 2x2 cubeFirst stage is to solve the bottom layer and bottom surface colourSecond stage is to solve the top surface colourThird stage is to orient the top layerTo find the loss of time;i measured the total time taken to solve the rubicks cube and the time taken at various stages.My goal is to find; why it takes more time at certain positions and how to solve it faster.Cube movement Legend:U: UpR: RightF: Front': inverted (anti clockwise)B: BackL: LeftThe scramble pattern used wasU R U' F B B R F F R' L LTotal Time taken: 19 secondsBreakupFirst Layer (Common to all solutions): 6 secondsRest using Algorithm: F R U R' U' F' : 13 secondsTotal Time taken: 14 secondsBreakupFirst Layer (Common to all solutions): 6 secondsRest using Algorithm: R U R' U R U U R': 8 secondsTotal Time taken: 17 secondsBreakupFirst Layer (Common to all solutions): 6 secondsRest using Algorithm: R U U R' U' R U' R' : 11 secondsConclusion:Based on the analysis above; i find the finger movements specially inverting movements and having mix of Front Right & Up take longer time compared to Right and Up movements.The reason for this is; since the fingers are positioned on the bottom layer movement of up and right is relatively easier than front moment. Front requires moving of extra fingers compared to Up and Right movements. The more the inverted movements takes more the time taken. Since it also brings in extra movements in the hand and brakes the flow of finger movements.i plan to continue this experiment & analyse with higher order cubes like 3x3 and 4x4

**Project Code**:**Physics-01** **Online ID:1665**

**Title: OPTIMISATION OF PERFORMANCE OF VERTICAL AXIS WIND TURBINE**

**Name: ANJANA RAMESH & X Std: 9**
**Guide: ASHA KIRAN**
**School: Vagdevi Vilas School Bangalore Munnekolalu**

**ABSTRACT:**
The generally used vertical axis wind turbines are of two types that is either darrieus or savonius type. The darriues uses lift force and is efficient at high speeds and savonius uses drag force and is self starting. This project aims at combination of these two designs to improve self starting and high speed characteristics also the performance is improved the introduction of high lift

devices in the desgin. These new type of vawt can be used on house tops; top of street lights to power the lights.

**Project Code**:**Physics-02 (Team)** **Online ID:1708**

**Title: ROOM LIGHT CONTROLLER WITH VISITOR COUNTER**

**Name: Amulya B.M & Thejaswini G Std: 9th**
**Guide: Dola Bhattacharya**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
In traditional surveillance system if there is no intruders; sensing device which continuous to work & consumes much power.In this system we are using microcontroller (P89V51RD2); two IR sensors we are using one for entrance side and another one for exit side. and two relays using for application side; one switch and Buzzer.When we press the switch button the module will be start to work. If any person is entering in to the room the entrance IR is sensed; the signal is send to the microcontroller; and the visitor counter is start to count at the same time inside the room all the lights and fans will be ON. If any person is come out of the room the Exit IR is sensed and that signal is send to the microcontroller; the counter will be decremented. If no one in the room then all lights and fans will be OFF. So that by implementing this project we can save the power.

**Project Code:Physics-03 (Team)** **Online ID:1709**

**Title: LI-FI BASED INTELLIGENT VOICE COMMUNICATION AND DEVICE SWITCTHING**
**Name: Bhoomika.G & Ganashree.G.M Std: 9th**
**Guide: Dola Bhattacharya**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
In simple terms; Li-Fi can be thought of as a light-based Wi-Fi. That is; it uses light instead of radio waves to transmit information. And instead of Wi-Fi modems; Li-Fi would use transceiver-fitted LED lamps that can light a room as well as transmit and receive information. Since simple light bulbs are used; there can technically be any number of access points. It is possible to encode data in the light by varying the rate at which the LEDs flicker on and off to give different strings of 1s and 0s. The LED intensity is modulated so rapidly that human eyes cannot notice; so the output appears constant.

**Project Code:Physics-04 (Team)** **Online ID:1748**

**Title: EFFICIENT FOR FIELD RADIO FREQUENCY ENERGY HARVESTING For COIN BASED MOBILE CHARGER**
**Name: Ruchitha.K & Bhoomika.BL Std: 9**
**Guide: Dola Bhattacharya**
**School: Vagdevi Vilas School; Bidadi**

**ABSTRACT:**
The objective of this project is inserting the coin using charge for your mobile phone in public places. This project is very useful to people who are all using mobile phone without charging condition in pubic places. In this project; who are all using mobile phones in outside of home are office without charging condition. The coin based mobile phone charger is very useful to that person for using coin to charge for that mobile.An RF-DC power conversion system is designed to efficiently convert far field RF energy to DC voltages at very low received power and voltages.To implement above project mainly we are using Microcontroller; slot sensor; ALCD; KEYS; mobile charger; solenoid and weight measurement system.In this project slot sensor is used for to insert the coin.the sensor senses and sends the corresponding electrical output signal to microcontroller. The microcontroller unit analysis the number of coin dropped on the coin box and according to that the sensors operates.

**Project Code:Physics-05 (Team) (Jr)** **Online ID:1749**

**Title: HIDDEN ACTIVE CELLPHONE DETECTOR**
**Name: Pawan Sai S & Raj Suresh Panda Std: 8**
**Guide: Dola Bhattacharya**

**School: Vagdevi Vilas School; Marathahalli**

**ABSTRACT:**
The main scope of project is to sense the presence of an activated mobile phone from a distance of one-and-a-half meters to prevent the use of same in the examination halls.In this project an RF detector using tuned LC circuits is formed for detecting signals in the GHz frequency band used in mobile phones as the transmission frequency of mobile phone ranges from 0.9 to 3 GHz.A capacitor is used to form a part of the LC circuit as C while the lead of the same forms the L to receive RF signals from the mobile phone. When the mobile phone is activated the RF transmission signal is detected by the detector and starts sounding a beep alarm and the LED blinks.

## Project Code:Physics-06 (Team) Online ID:1821

**Title: Desalination using vacuum technique**
**Name: prabhupada das & barath Std: 9th**
**Guide: Venkata Ramana Reddy M**
**School: Vagdevi Vilas School; marathahalli**

**ABSTRACT:**
Desalination using vacuum techniqueAim: - To get drinking water out of saline water using vacuum technique.Material required: - vacuum pump; big black box container; small container; saline water; pipe; connecting wires.Procedure: - This project is based on converting saline water to a drinkable source.1.A big black box container which helps to absorb surrounding light making it warm.2. A small container with saline water and placed in the middle of big black container.3.Make a small appropriate hole on a small container so that the pipe coming from the pump has to fit exactly without any leak.4.A pipe of suitable length; one end is connected to the pump and the other to the small container through the hole so made.Note: - Making sure the pipe through the small container does not touch the saline water. 5.As the pump is switched ON; it starts to suck the air present around the small container i.e. in the left over part after filling the saline water.6.A vacuum is created and its pressure is maintained to prevent the sucking of saline water.7.Once the entire air is removed. The saline water starts to boil and evaporate. The evaporated air condenses and is forcefully dragged through the vacuum pump and passed to different container were air condenses to form drinkable water.Observation: - This is based on theoretical facts found the saline water can be converted to drinkable source of water using vacuum technique.

## Project Code:Physics-07 (Team) (Jr) Online ID:1823

**Title: Nano Hybrid Wind mill**
**Name: Tilak & Avikshith Std: 8th**
**Guide: Venkata Ramana Reddy M**
**School: Vagdevi Vilas School; Varthur**

**ABSTRACT:**

Nano Hybrid Wind millAim: - To generate electric power using wind energy in large motor vehicles and e- vehicles.Material required: - series assembly of micro hybrid windmill; fitters and screws; generator.Procedure: - This project is about generating electric power using wind energy so that the power generated will be an extra source to ON the interior electric equipment of car or bus or any large motor vehicles.1.Building an assembly of micro hybrid windmill is a challenge. However we made a design of it.2.Collected individual micro hybrid wind mills.3.Took an estimated length of air went present in front of vehicles radiator.4.Making sure the assembly's length is same as the air went thereby it as fit exactly.5.The assembly is made into sections and each one will have hole so that windmill can be incorporated.6.The assembly having 4 to 5 windmills which will be connected in series amongst them includes a generator which will produce a dc power of 2-5 volt.7.Then the assembly with the windmills is fitted back of the air vent of any large motor vehicle.8.As the vehicle moves; the windmills start to function intern the generator produces power.9.The power so generates will be directly given to the battery of the vehicle for storage which gives an addition source of supply.10.That source can be used to power on the interior electronic equipment of the vehicle.Observation :- The power generated was about 2- 5volts dc and that was driven to ON the accessories of the vehicle.

**Project Code:Physics-08 (Team) (Jr)** **Online ID:1834**

**Title: Blind Blue-sensor**

**Name: Akhilesh R & kuval k v Std: 7th**
**Guide: venkat ramana reddy m**
**School: vagdevi vilas school; bidadi**

**ABSTRACT:**

Azolla has been used for hundreds of years in Asian countries as a bio fertilizer; mainly in paddy fields; where the crop is cultivated with Azolla. Nitrogen is provided by Azolla via the nitrogen-enriched water and additional nitrogen when the water is drained from the field and Azolla starts to degenerate; it releases nitrogen for the crop. Other popular uses of Azolla; are as a livestock feed on farms and fish food; for bioremediation or recovering nutrients from wastewater and for biofuel production.The main objectives of the proposed project are:•Confirmation of cyanobacterium association with Azolla•Determination of vitamin B2; B3; B6 and B12 content in Azolla

**Project Code:Physics-09 (Team) (Jr)** **Online ID:1830**

**Title: Cyclone garbage separator**

**Name: Charan S. Gowda & Chirag Buddivanth G. Std: 8**
**Guide: Bhavisha Wala**
**School: Vagdevi Vilas School; Varthur; Bangalore**

**ABSTRACT:**
Blind Blue-sensorAim: - To design a spectacle for visually disabled people which run using bio blue-sensor. To make active listening using sonar ranging.Material required: - mini speaker; spectacles; sonar radiator; receiver.Procedure: - This project is basically for people who are visually disabled. Imagining life without vision is difficulty. To overcome the difficulty experienced by them will be enhanced by our design. A suitable spectacle is mounted with the Nano sonar transmitter and receiver on it. The signal received is then converted to electrical signal; so that they can sense the accurate distance of the obstacles approaching them. Results\observation: - The signal was transmitted from sonar to receiver. The workable range was about minimum of 1kmConclusion: - The person was able to identify the obstacles around him by the signal transmitted by the sonar.Innovation: - Nano sonar transmitter and receiver was used to transmit and receive the single to know the objects approaching.

**Project Code**:**Tech-01 (Team)** **Online ID:1641**

**Title: Solenoid Valve Based Automatic Water Lock System in Apartments for Minimizing Water Loss due to Leaking Taps and Cisterns**

**Name: NAVYAA SHAH & SUBHASHREE CHANDRASEKAR Std: 9**
**Guide: Suryanarayana Rao S.R**
**School: SISHU GRIHA MONTESSORI AND HIGH SCHOOL (BANGALORE)**

**ABSTRACT:**
Our project aims at minimizing water loss due to taps and cisterns in residential and commercial units like hotels by providing automatic water locking system utilizing a solenoid valve. Innovative step to conserve water by minimizing losses due to leakages. Genesis of the ideaWe are prompted by observing automatic power switch off system in in hotel rooms when they leave the rooms to conserve electrical power. We thought of designing a simple system to cut off water also when they lock the rooms.Design and Methodology:A simple cost effective solution was designed that serves its purpose to minimize water leaks when the door is locked.Lock lever activates the circuit which switches on/off a solenoid valve using a reverse switch. Design and Methodology:Future Scope1.Demonstrations in apartments /organizations.2.Discussion with builders3.Take up with Govt. authorities4.Apply WiFi technology to avoid long wiringResults / Observations / FindingsA design which is simple and cost effective could be evolved by design thinking based on solenoid valve. Loss due to leakages is estimated by Bangalore water Supply and Sewerage Board as 48%. At least 10% may be due to leakages in taps and cisterns.This has bright future prospects of resulting in significant savings in water globally and addressing a social cause particularly in hotels and apartments. Saving in water results in saving in power and thereby reduce carbon footprint.

**Project Code**:**Tech-02 (Team)** **Online ID:1644**

**Title: IntelliHorn**
**Name: Aishwarrya V.P. & Sanjna Kartik Std: 9**
**Guide: Suryanarayanarao S.R.**
**School: Sishu Griha Montessori and High School**

**ABSTRACT:**
After facing the problem of unnecessary and loud honking ourselves; we were prompted to create the IntelliHorn; a device that is built into the vehicle during its manufacture to limit the volume of vehicle horns. Our initial idea was to switch off the vehicle horn in silent zones and reduce the horn volume in normal areas if it was above the legal limit. After inputs from our mentors and suggestions received from interested customers; we realized that during emergencies; the horn may be necessary. Thus; we decided to reduce the volume of the horn further in silent zones (40 – 50 dB); while reducing the horn volume in normal areas only if it is louder than the limit. The IntelliHorn would use GPS inputs to find the location of the vehicle and check if it was within 100 meter radius of a school; hospital or court. The horn volume would then be adjusted accordingly. We have completed two stages of prototyping and are now working on the third stage with our new idea. The third stage also includes working on the GPS module. In our prototypes; we have used a buzzer instead of a vehicle horn and user inputs instead of GPS. We are currently working on the GPS module.

**Project Code**:**Tech-03 (Team) (Jr)** **Online ID:1690**

**Title: Smart soil tester**
**Name: Adarsh Kunnath Menon & Tejas Krishnamoorthi Std: 8th Std**
**Guide: RAO Settigunte**
**School: Sishu Griha Montessori and High School**

**ABSTRACT:**
Project ObjectiveBuild a soil testing device which inserted in soil reads the soil parameters and provides immediate results to a farmer. We plan to make this a connected device that can transfer the result to a smartphone; making it easy for the farmers to send results for further analysis and use it for appropriate crop selection; irrigation and fertilization. This device uses the Intel Galileo processor and sensors to detect the basic soil parameters and provide readings to farmers immediately to take timely actions. We have currently programmed the reading of the following soil parameters - Moisture; Light & Temperature levels. We have programmed the device to currently display the results on the computer on these parameters when the sensors are inserted into the soil. We further plan to integrate readings of the pH; soil conductivity; NKP and micro nutrient levels to this and to connect the reading to a smartphone via blue tooth.

**Project Code**:**Tech-04** **Online ID:1860**

**Title: Emergency Alert System for Senior Citizens**
**Name: Shashank Rammoorthy & X Std: 11**
**Guide: Madhu Rammoorthy**
**School: Stonehill International Schoool**

**ABSTRACT:**
While talking with a friend of mine; I found that his grandfather had been injured recently. The previous night; his grandfather (a man with Parkinson's Disease) had slipped while in the bathroom. The man could not scream for help - he tried but apparently it was not loud enough. He had a mental degenerative disease; and was senile. The man sat on the floor of the bathroom for 4 hours before anyone realised. He had sustained a hip injury that was far worse than what should have happened in a simple fall in the lavatory. It was a miracle that he had not suffered serious effects; actually. Cases like these are quite common; and often result in grave consequences - sometimes even death.According to the Centre for Disease Control; more than 33 percent of falls involving senior citizens in the USA occur at home and specifically; in the lavatory. People over 85 suffer more than half of their injuries near the lavatory. This figure is likely quite similar in India; and is a serious problem. More and more senior citizens are living alone; out of choice or otherwise.The topic of my project is "Building an Emergency Alert System for Senior Citizens"; the final product being an emergency alert system that is composed of a microcontroller laser tripwire-cum-ultrasonic sensor system that functions in conjunction with an Android smartphone. The focus of this project is to enable a reduction in response time while keeping the cost of the system low.

**Project Code:Tech-05 (Jr)** **Online ID:1873**

**Title: An Android App for Learning Math**
**Name: Megha N Iyer & X Std: 5**
**Guide: X**
**School: Twinklers School; Bangalore**

**ABSTRACT:**
Learn Math==========This application is used for learning basic mathematics. Following features are supported Main Screen:1. A student can learn multiplication tables just by entering the number and clicking on the Tables Button. The system will show table of that number.2. To practice and be proficient in learning tables; one could orally narrate a table and record it.For example; if we want to record table of 7; then one can first get the 7 table and thenread it aloud and record it. Later it can be played for practicing.Any number of such tables can be recorded and stored.3. On recording; the Record button turns to red colour indicating that the voice is being recorded. On the click of Play; the Play button turns to green indicating that the voice is being played back. Any time the user can click Stop button to stop either while Recording/Playing.Quiz Screen:1. A student can take quize in Addition; Subtraction; Multiplication & DivisionThe system

randomly selects the numbers with the maximum value as specified in the Difficulty Level screen.2. The system also provides a scratch pad writer that can be used during the quiz. It can be easily wiped out by shaking the screen.3. Since division can result in a number having many decimal places; a care has been taken to restrict to two decimal places. Hence the user should answer only up to two decimal places.Difficulty Level Screen:1. For the quiz; you can setup the difficulty level; by changing the maximum value as desired.Happy Learning!