

ABSTRACT BOOK

INDIAN SCIENCE & ENGINEERING FAIR (INSEF)

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

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Title: Effect of seed strips on Growth and Yield of chili plants

Name: Tanishka Kishor Kaspale & Sae Vishwanath Palav Std: 8

Guide: Mrs Sujata Patil

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Seed preservation is very important to maintain quality viz, germination, physical purity, vigour etc. To be successful at seed saving, new skills need to be developed to ensure that desired characteristics are retained in the soil of the plant variety. Our project aims to evaluate the effect of different material seed strips on growth and yield of chili plant. Different chili seed strips were made from cotton, plastic, silk, plain paper, tissue paper and corn husk and preserved them. Six different pots were filled with uniform soil and different seed strips of chili was planted and watered for 2 months. Monitored the plant condition and recorded the readings. control experiment was also maintained without the seed strip. Observed plant growth was monitored. Data was statistically analysed. Seeds strips made from corn husk showed better growth than the control. The yield of pot having corn husk seed strip had no of fruits more than the control. Not much variation was found, the stem length and diameter of the plant. Thus using corn /tissue paper is to be a viable tool to increase the chilli production also for preserving the seed under tropical condition. Germination was faster in pot with tissue paper than corn husk and the control condition of plant was good in Pot a,b,c, d Data was statistically analysed. Soil tested showed that pot with corn husk had more minerals. Yield of crop (fruits) was better in pot with corn husk with 45 and tissue paper seed strips 35. Not much variation was found, the stem length and diameter of the plant. Corn husk strips help in preserving seeds. Based on the experiment corn husk seed strip has tremendous effect on the growth, yield of chili. Thus concluding corn husk Chili seed strip showed superior performance compared to other seed strip. Cultivation of chili done with corn husk seed strip could bring in more scope for production of spices.

Title: Plantservatives as wiper

Name: Chinmay Vinayak Kshirsagar & Sarvesh Mahesh Sawant Std: 9

Guide: Mrs Prasita Nair

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Nature has been a source of medicines for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Both Oxalis Corniculata (Wood Sorrel) leaves and Trachyspermum ammi (Ajwain) leaves has got lot of medicinal values like antibacterial, diuretic, expectorant, astringent effect on wounds etc. The present generation is so much dependent on cell phones

that they are more prone to infections caused due to oral bacteria present on the mouth piece of cell phones. While speaking on the cell phones, lot of oral bacteria are spread on the mouth piece of the cell phones. Our project aims to find out if the extract of leaves of *Oxalis Corniculata* and *Trachyspermum ammi* can act as an antibacterial wipe for these cell phones.. The antibacterial activity was performed under sterile condition by using Agar cup diffusion method. Five extracts were prepared for this study such as chloroform extract, benzene extract, pet. ether extract, ethanolic extract and aqueous extract. The extractions were diluted as 200 mg/2 ml ratio. Each 200 mg of aqueous extract and ethanol extract was diluted with 2 ml of distilled water respectively; whereas the ether extract was suspended with tween 80, a suspending agent. The antibacterial test was tested against the bacteria's from swabs collected from mobile. The test was done in triplicate with sterile Petri plates (10×10 cm) in Muller Hinton agar media. 0.5 ml of diluted culture was poured on each Petri plates and a well of 8 mm diameter approximately was cut with sterile metallic borer in the inoculated agar plate. The wells were filled with previously diluted 4 different extracts separately. The plates were labeled and incubated for 24 hours at 37°C. At the end of incubation period, the zone of inhibition (diameter) was measured and. According to the present study, the most potent extract against bacterias from swab of mobles was the mixed extracts of wood sorrel and ajwain followed by other extracts. Thus it was showed that has *Oxalis Corniculata* and *Trachyspermum ammi* has the antibacterial activity and can be used to make wipes to inhibiting microbial growth. The screen guard on the cell phones can have a coating of *O. corniculata* and *Trachyspermum ammi* extract to prevent the harmful effects of the oral bacteria present on them.

Project Code: Bio-03 (Team)

Online ID:1610

Title: Wild turmeric and *Curcuma amada* - Promising spices to inhibit the growth of antibiotic resistant bacteria

Name: Ms Maithili Bhaskar Pawar & Ms Tanaya Janardhan Pawaskar

Std: 9

Guide: Mrs Rajeswari Nair

School: The North Mumbai Welfare Society's High School

ABSTRACT:

This study investigates the use of combined extract of traditionally used spices wild turmeric and *Curcuma amada* to inhibit the growth of antibiotic resistant bacteria *Escherichia coli* (*E. coli*) and *S aureus*. Some plants produce a variety of compounds of known for its therapeutic and antimicrobial properties. Antibiotic resistance is a problem that continues to challenge the healthcare sector in a large part of the world. One major contributor to antibiotic resistance is the overuse of antibiotics in agricultural practices which can facilitate the development of bacterial resistance through the spread of infected livestock waste. 75-90 percent of tested antibiotics are excreted from animals un-metabolised and enter

sewage systems and water sources. Therefore, animal waste not only contains resistant bacteria, but also antibiotics that could then foster the emergence of resistance in bacteria beyond those in an animal's gut – including bacteria that may pose a greater risk to humans. This manure from farm animals is often used on crops as a fertilizer, which has been shown to create resistance.

Project Code:Bio-04 (Team) (Jr)

Online ID:1612

Title: Estimation of Vitamin C

Name: Aishwarya Patil & Anushka Kurhade Std: 7

Guide: Mrs Rajeswari Nair

School: The North Mumbai Welfare Society's High School

ABSTRACT:

Many people today rely on vitamin supplement tablets. But fruit juices, vitamin supplement drinks, or vitamin supplement foods may contain just as much vitamin c as supplement tablet . Which one is better through? In this project various experiments are conducted to find out the amount of Vitamin C in pomegranate and Orange, and the same in its processed juice. Volumetric Method: Ascorbic acid otherwise known as Vitamin C is an antiscorbic acid. It is present in goose berry, bitter gourd etc, In high amount. Generally it is present in fruits and vegetables. It is a water soluble and heat-liable vitamin. The method described below is easy, rapid and a large number of samples can be analysed within a short time. Ascorbic acid reduces the 2-6 dichlorophenol indophenols dye to a colourless leuco-base. The ascorbic acid gets oxidized to dehydroascorbic acid. Though the dye is a blue coloured compound, the end point is the appearance of pink colour in acid medium. Oxalic acid is used as the titrating medium.

Project Code:Bio-05 (Team)

Online ID:1615

Title: MILLET FOR NUTRITIONAL SECURITY

Name: VARUN SRINIVAS DASARI & ATHARVA RAJESH NAIK Std:

9-B

Guide: DURGESH PANDIT HOLE

**School: NORTH MUMBAI WELFARE SOCIETY'S HIGH SCHOOL
mumbai**

ABSTRACT:

Proteins, iron (Fe), calcium (Ca) deficiency is the most common nutritional deficiency worldwide. Deficiency is particularly widespread because of a general lack of consumption of millet coupled with a high consumption of cereal grains specially wheat. Our objective is to compare the micro nutrients in the millet (Pearl millet, Sorghum, Finger millet by) to wheat. The micro-nutrients are more in millet than wheat. The study revealed that Finger millet has thirty times more Calcium than wheat while every other millet has at least twice the amount of Calcium. Millet are so rich in iron that wheat negligible in front of them

Project Code:Bio-06 (Team) (Jr)

Online ID:1616

Title: comparative study of retention of nutrients in earthen ware and steel utensils

Name: Ganesh Challappa & RISHABH SUDHAKAR SHETTY Std: 8

Guide: DURGESH PANDIT HOLE

School: NORTH MUMBAI WELFARE SOCIETY'S HIGH SCHOOL MUMBAI

ABSTRACT:

The earthenware had once been an intrinsic part of the Indian household. In olden days earthenware was used for cooking purposes and storing water, milk and milk products in the earthen ware known as kalash for it keeps the water cool. Let us see what are the benefits of cooking in clay pots. Earthenware clay pots being alkaline in nature helps in neutralizing the pH balance of the food by interacting with the acid present in the food. Foods that are naturally acidic will acquire some natural sweetness. Acids in foods like tomatoes when cooked in earthen pots give the food a wonderful taste. As the soil is the ultimate store house of all minerals required for our body and when the Earthen wares made up of soil are heated for cooking the food some minerals get mixed with the food to be cooked and it enhance the mineral value of the food.

Project Code:Bio-07

Online ID:1884

Title: Computer Aided Discovery of Novel c-Myc Max mediated Gene Transcription Inhibitors to combat Cancer

Name: Parth Raghav Std: 12

Guide: Brijpal Raghav

School: K R Mangalam World School Vikaspuri

ABSTRACT:

Cancer epidemic remain a constant threat to public health worldwide. The WHO predicts that the number of new cancer cases will rise to 22 million in the next two decades, from 14 million cases with 8.2 million fatalities in 2012. Antineoplastic drugs are crucial to treat patients until we have highly accurate diagnosis services. Therefore, new anti-cancer drugs are urgently needed to prepare for incessant epidemic. Transcriptional regulation of c-Myc (E-Box activation) cascades are key signalling pathways involved in the regulation of normal cell proliferation, survival and differentiation. Deregulation of c-Myc contributes to carcinoma. The c-Myc-Max complex (E-Box) mediated gene transcription is well conserved and essential part for aberrant deregulation of c-Myc, which makes it a potential drug target. Inhibitors for the same could potentially block the growth/metastasis of cancer, which is required for excision of breast, non small cell carcinoma et cetera. I used an interdisciplinary approach combining computational research with biological assays to expedite the discovery of new Myc inhibitors. A novel

pipeline was introduced for virtual screening of compound libraries; which included, using Convolutional Neural Networks (CNN) for activity and free binding energy prediction and alignment of small molecule inhibitors for Myc oncoprotein. Aforementioned parameters were used to assess the potency of ligand, while probabilistic pharmacophore models were built and used for final virtual screening of compound libraries via Inductive Logic Programming (ILP). A fluorescence-based assay was set up to validate virtual screening hits as Myc inhibitors. In parallel, molecular dynamics simulations and computational solvent mapping of the c-Myc were performed to construct a comprehensive database of binding pockets and druggable hot spots. Comparative Molecular Field Analysis aided in drawing the rudimentary 3D structure of ligand given the bioactivity yielded by CNN. Molecular docking of the discovered inhibitors to Myc protein active sites revealed interacting residues. Qualitative Structure and activity relationship (SAR) analysis led to identification of more drug leads. As a result, I identified a number of new, potent and structurally diverse c-Myc inhibitors with great potential to be developed into new anti-metastatic cancer drugs. The structural study also provided valuable information for designing even more potent inhibitors. Moreover, study establishes the principle importance of machine learning and its usage in the field of drug discovery. Therefore, these findings will help combat cancer and save lives. A patent would be filed on my discovery after the permission is granted from INSEF Selection Board.

Project Code:Bio-08 (Team)

Online ID:1888

Title: Synthesis of Silver Nano-particles naturally using Banana bract and As an Antibacterial Agent

Name: Beulah Sundararajan & Sonal Chetan Satra Std: 9

Guide: Nalini Nainar

School: NMWS High School Rifle Range Ghatkopar W Mumbai

ABSTRACT:

Recently there has been a hue and cry over increasing bacterial infections. The clothes that we wear does have high potentials of allowing bacterial growth and thereby infecting us. Here is an attempt to find a solution to this problem naturally using banana bract extract. The extracts of banana bracts made from about 100g of the banana bracts boiled in one litre of a solution of 1%NaOH (0.025M) was made and this solution was concentrated to 500 ml. The slurry was filtered to discard any solid material. The extracted liquor was used as the foundation of the dye. AgNPs were prepared by adding volumes of the bracts extracts in a range between 25 ml to 100 ml with 50 ml of AgNO₃ solution (10⁻³ M). Then, the volume was mixed with de-ionized water to reach a final volume of 200 ml and then was subjected to microwave irradiation for 3 min at 800 watt and then allowed to stand for 24 h. The cotton fabrics were dyed using the extracted liquor (banana bracts extraction) in the dyeing bath at 80 ° C for 90 minutes under

stirring conditions. After completion of dyeing, the fabrics were washed with water and air dried. Application of synthesized AgNPs on cotton was carried out. The treated fabric samples were thoroughly washed, neutralized and dried in air. The washing fastness of the fabric was performed. Evaluation of Antimicrobial Activity Monitoring of antibacterial activity against Staphylococcus aureus(gram +),and Gram-negative Escherichia coli was done.

Project Code:CompSc-01 (Team)

Online ID:1882

Title: VisionX

Name: Arshdeep Taneja & Ishan Malhotra Std: 10

Guide: Gesu Dagar

School: Amity International School Sector 44 Noida

ABSTRACT:

Seeing the exponential bloom in eye problems like eye-strain, focus fatigues, and other symptoms of Computer Vision Syndrome (CVS), we developed a device capable of eradicating or reducing these problems to an extent. The compactly designed device can work as a standalone as well as an annexation to a laptop (other devices to be supported soon). A cleverly programmed luminosity sensor, with an IR diode and a full-spectrum diode observes the different aspects of the user's entire 360*360 environment (like the roof, the surface behind the screen, that in front of the screen, other walls, working surface, etc.) with different judgement criteria. It then calculates the required brightness to a precise level and sets it to the screen of the laptop. It also makes suggestions to the user to make the environment ergonomically comfortable, and also illuminates the working surface by its inbuilt LED to provide a precise brightness using pulse width modulation. All this allows the user to work without getting tired, therefore increasing his/her productivity, safeguarding their eye-health and thereby not compromising on their health in the overall process of development. VisionX can be connected to the laptop simply through a USB cable and gets installed in no more than a minute. The TFT (Thin Film Transistor) touch screen on the device, helps the user to interact with the device, where he/she can choose from an array of programs. This provides an easy interface to this immensely useful piece of technology.

Project Code:Energy-01 (Team)

Online ID:1620

Title: Hydrogen Sulphide - Thermoelectric Dual Fuel Cells with optional Hydropower Generator

Name: Aryan Gupta & Ayush Sharma Std: 9

Guide: Rina Singh Chauhan

School: Amity International School Sector-46 Gurgaon

ABSTRACT:

In this project we generate electricity using hydrogen sulfide gas. We use Copper Oxide/Iron II,III Oxide (1st fuel cell), Aluminium III Oxide (2nd fuel cell),and

Carbon(3rd fuel cell) anode and cathode with nafion or any other semi-permeable membrane (as it breaks the fuels into electrons and ions with electrons travelling from anode to cathode and ions travelling through nafion). There would be 3 fuel cells, the first one using hydrogen sulfide as fuel and oxygen as other agent producing water and Sulfur dioxide(300 Celsius). Now, this Sulfur Dioxide is transferred to a second fuel cell where it enters through the cathode and hydrogen sulfide enters through anode to produce water and sulfur(300 Celsius). This Sulfur is kept in a third fuel cell. Now, the water produced is used to run turbine and produce hydroelectricity. The water now enters our thermoelectric generator and gets supercooled in a funnel, and when it is supercooled, stopcock is opened to let the water fall on the ice which freezes water. To create a temperature difference of 20 Celsius, we will use the heat produced by the reactions in the fuel cells and thus electricity is produced. Now a rechargeable battery is charged through the thermoelectric generator, and is used to electrolyze water after it moves into the electrolyzer, to convert water into hydrogen and oxygen. The oxygen is again used as the other agent in the first fuel cell and hydrogen goes to the third fuel cell, where hydrogen enters at the anode and sulfur enters at the cathode to produce energy and hydrogen sulfide, the fuel used in the first and second fuel cell(450 Celsius). Also, this method can be used by people living away from petroleum refineries by using sulfate-reducing bacteria.

Project Code:Engg-01

Online ID:1605

**Title: SMART DETECTOR LIFE PROTECTOR DURING BLIND U
TURNS-VEHICLE ALERT SYSTEM AT GHAT U-TURNS**

Name: MOHAMMAD NASEAR AHMED Std: 12th std

Guide: ABDUL JILANI BASHA

School: IQBALIA JUNIOR COLLEGE HYDERABAD

ABSTRACT:

Almost 40% of road accidents take place on these U-Turns. The “blind” U-Turns are perhaps the most frequent locations where accidents occur because they, by nature restrict the visibility of the pathway. The driver cannot see what is on the other side of the road. He doesn't know if there's a vehicle coming from the other side or not. Due to lack of indication system, vehicles usually moved out off the track during night time. Over 1,37,000 people were killed in road accidents in 2013 alone, that is more than the number of people killed in all our wars put together. There is one death every four minutes due to a road accident in India. A popular solution that has been implemented to solve this problem is the use of reflectors to see the vehicles coming from the other side of the road, but it has its own limitations. During night time, the headlights of the vehicle approaching in the opposite direction falls on the reflecting mirror and gets reflected directly onto the windshield of the vehicle- which obstruct the view of the driver. Hence, a system that doesn't have these limitations and can reduce the amount of accidents near the

U-turns is the need to the hour. SOLUTION: The Vehicle Alert System alerts the users near a U-turn if a vehicle is approaching in opposite direction to avoid accidents. It consists of four weight detectors, four LEDs as a primary indicator and a siren which makes the driver alert before they meet with an accident. • During day time when a vehicle passes over the weight detector, the gear which is under the weight detector below the road level compressed which in turn makes the shaft rotate the dynamo. • Thus the mechanical energy produced is converted into electrical energy. With the help of LDR system the electrical energy is utilized for the indication for the vehicles during night as well as during day time in Fog. • The WEIGHT DETECTORS get activated when vehicle passes over it. They are placed at a distance of 20 meters and 30 meters from centre of U-turn on either sides of a blind turn. • The LEDs are placed on either side of the roads such that the first LED is visible to vehicles traveling in the first lane and the second LED to those in the second lane. The siren is placed such that its sound can be heard on both the lanes. • When a vehicle is on the 30-meter mark- the first WEIGHT DETECTORS detects it and the first LED on the opposite lane is lit up. This serves as an indicator to the vehicles coming in the opposite direction to slow down. • When the vehicle crosses the 20-meter mark, the second WEIGHT DETECTOR detects it and the second LED on the other lane is lit up. • Then the secondary siren gets activated along with high focus blinking lights, indicating that the 2 vehicles from either sides are about to crash at the point of U-turn. • This happens 15 seconds before the accident. This helps to alert the driver on the other road to slow down even if he missed the first indication through the LED. • This system with two modes of indication using a light and siren ensures that the vehicle on the opposite lane slows down and vice-versa.

Project Code: Engg-02 (Team) Online ID: 1688

Title: Buyovancy on demand- Whoosh Belt

Name: Vidhita M Jagwani & Kiara Milind Sankhe Std: 9

Guide: Mrs Seema Bajpai

School: Utpal Shanghvi Global School Mumbai

ABSTRACT:

Aim: The purpose of this project is to design a compact device, which is very easy to carry and use, and can save the user from drowning, during unforeseen circumstances. The ultimate aim is to reduce the number of deaths due to drowning. **Description and working:** The device consists of a waist belt, which can be worn on waist like a normal belt. A tube is attached to the belt and is neatly folded. The opening of the tube is connected to a small pump, which is only about 12 cm in length and also very light. The pump holds a carbon dioxide cartridge. This can be worn as belt whenever a person is going for swimming or water sports, as a safety precaution. So in case the wearer starts drowning because of any reason, he/she just has to pull/press a lever (depends upon the model of

pump used). This allows the carbon dioxide to inflate the tube in 1 to 1.5 seconds and the wearer quickly rises above the surface of water, as carbon dioxide is less dense. Since it is worn on the waist, the wearer's upper body rises above water and he can breathe allowing him to be normal within few seconds.

Project Code:Engg-03 Online ID:1689

**Title: Modified Nitrogen doped Graphene based high performance
Glucose sensing through perspiration**

Name: Arunabh Awasthi Std: 11

Guide: Kanchan Choubey

School: Royal School Sanjeevni Nagar Jabalpur

ABSTRACT:

Diabetes mellitus is a chronic, incurable disease in which the patient is prone to hyperglycemia. Hyperglycemia engender organ malign glycation which causes complications such as blindness, kidney failure, heart attacks, stroke and lower limb amputation in diabetic patients. Current handheld blood glucose monitors are invasive and restricted to one-shot measurement. Non-invasive and in-vivo glucose meters thus currently remain 'holy grail' in biofluid analysis. In this research, a new innovation based on nitrogen doped graphene functionalized with 1-pyrenylboronic acid was developed which provided continuous and ultra-highly sensitive detection of trace amounts of D-glucose. Nitrogen doped graphene (N-Graphene) is an enhanced form of graphene known for its extraordinary properties in analyte sensing which makes it a pre-eminent contender for new generation sensors. Boronic acids are zwitterion Lewis acid of organoboranes class, particularly known to exhibit reversible affinity complexation in cis 1,2 and 1,3 diols to form boronate esters. The developed invention employed 1-pyrenylboronic acid functionalized nitrogen doped graphene field effect transistor and controlled temperature based perspiration inducing mechanism which ensued in complete electronic, rapid and highly sensitive D-Glucose detection in thermally induced perspiration for in-vivo correlation to blood glucose. The developed device was tested in a controlled environment as well as in an in-vivo setting which consisted of 19 participants. Results demonstrated proportional n-type and p-type doping characteristics in response to corresponding D-glucose analyte concentration. Overall, the sensor exhibited a remarkable 0.21 μM D-Glucose detection resolution as well as good correlation to reference blood glucose measurements, making it an exceedingly suitable as well as a non-invasive alternative to current invasive glucometers.

Project Code:Engg-04 Online ID:1879

Title: LEWATO FLUSHING SYSTEM

Name: RAJASHREE CHOUDHURY Std: 9

Guide: Mr S B Choudhury

School: JBS Public School

ABSTRACT:

With the increase of the world population, the management of various types of resources have become essential to overcome their present crisis. Many initiatives were taken in the past, but yet to be taken many innovative actions for effective use of natural resources like water, energy, minerals etc. In the same time, present Government of India has taken many initiatives for resource management and to improve standard of life for 125 million Indian. We feel, we the students of middle school also have responsibility to find out innovative solutions, express our thought through various science model, involve others and put effort to support green initiatives in local and national level. To make availability of freshwater to 7.2 billion population of the globe is the most serious challenge as per United nation. There is chance to face another world-war for capturing freshwater. Out of 2.59% freshwater among the total water of the earth, only 0.014% is readily available for use. As per UN report 85% of the world population lives in the driest half of the planet, 783 million people don't have access to clean water and almost 2.5 billion don't have access to adequate sanitation, 6 to 8 million people die annually from the consequences of disasters and water-related diseases. So we should try our best to conserve water. In my working model, I have shown few ideas on wastewater management wherever is possible, mainly in multistoried buildings. In our city, we have seen rainwater harvesting, but in real sense very limited use of rain water has been noticed. In the model, I have tried to make basin and flushing unit with two sources of water to use rainwater as well as freshwater simultaneously to fulfill our daily needs. I have demonstrated few ways of reuse and recycle of water, where wastewater or urine of higher floor can be used in lower floor without wasting energy for their lifting. As per my study, the presently available sanitation apparatus in the market have limited scope to use rainwater and freshwater simultaneously and there is need to up-grade their features. To demonstrate our ideas in prototype, I faced problem to get smaller size sanitation items for making working model. So I have made few sub-models to expand our ideas in working model with the standard parts available in the market. The water flow diagram of existing in multistoried building and proposed in the model:-

1. Use of wastewater of basin for flushing in urinal and toilet :-
2. Use of wastewater of basins of 1st. floor in urinals.
3. Use of waste water of basin of 1st. floor in flushing unit of toilet of ground floor.
4. Use of wastewater & urine of 1st. floor for flushing in ground floor toilet.
- Double water tank at roof to store freshwater in upper chamber and rainwater in lower chamber.
5. Waste water storing tank in every floor.
6. Double taps in every basin
7. Tilting of S trap pipe to flush dirt in lesser water. S trap is a hurdle for shifting dirt from pan to main out let pipe. By reducing height dirt can be shifted in lesser water.
8. Tilting of pan to flush dirt in lesser water.

Features of the model
Localized flushing to flush dirt in lesser water
70% Use of urine (mixed with water) for initial flushing in toilet and 30% flushing by wastewater /

rainwater / freshwater . Modify toilet flushing unit with two sources of water like urine / wastewater (70%) and freshwater / rainwater in 2nd. stage subsequently. Leg operated water tap for better and quick control / wash with minimum wastage of water. Automatic flushing on entry and exit on pan. Water to flush for 2 sec. on boarding on foot step of Indian pan or sitting on commode. Light indication / Alarm on not flushing

Project Code:Env-01 (Team) Online ID:1580

Title: To synthesis silver nano particles from wild almond & cluster fig leaf extract and its larvicidal activity against mosquitoes

Name: Ms Yukta Janardan Tembulkar & Shravya Bhaskar Shetty Std: 9

Guide: Mrs Rajeswari Nair

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Mosquitoes are the potential vectors of many diseases, including malaria, filariasis, dengue, brain fever. Plants contain an untapped reservoir of phytochemicals that can be used directly for synthetic pesti-cide Hence undertook the project . Leaves were washed and chopped , boiled and filtered. Then the extract was synthesized with AgNO₃ to get Silver nanoparticles (1ml:4ml) . It was incubated for 30 minutes. After incubating it was observed that, the colour of the synthesized solution changed into reddish brown.. The colour change of the synthesized solution indicated the formation of nano particles. Optimization was done with respect to the temperature, time range, volume and range of concentration. Different solutions were made with respect to their ratios. In first four solutions the extract was constant. In the second four solutions, silver nitrate was constant. Centrifugation was done separate the silver nano particles from the synthesised solution . The synthesis monitored by UV visible spectrometer. Toxicity test was conducted by taking larvae into water and the synthesized nano particles in different proportion . The larvae of Ae. aegypti have shown the 100% mortality to the combined synthesized AgNPs after 30 minutes while for larvae of Cx. Quinquefasciatus it was 90% The pupa of Ae aegypti has shown the efficacy LC50 4, LC90 12 and LC99 19 ppm after 2 h of exposure Thus the leaves synthesized silver nanoparticles have the potential to be used as an ideal eco-friendly approach for the control of mosquitoes

Project Code:Env-02 (Team) Online ID:1581

Title: COMPOSITE BOARD INSULATOR OF SUGARCANE BAGASSE

Name: Utkarsh Chaubey & Sahil walunj Std: 9

Guide: Mrs Seema Kadam

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Our study aims to make a composite board insulator from Sugarcane waste.

sugarcane bagasse waste was shredded and pulverized with the use of mortar and pestle. Then the crushed pulp was washed with water & Filtered Next, the pulp was soaked in sodium hypochlorite to loosen its particles and boiled & excess water was removed. The composite board formulation was investigated using 10g,20g , 30g & 50g of pulp with a small amount of water, the substance is mixed with cassava starch, Arabic gum starch in varying ratio of 1:1&:1 and heated for 3minutes. The mixture was pressed in a screw jack press with uniform pressure to form a board. The boards were dried and conditioned at room temperature. Sample of boards made with 50 g showed the best result. Experiments were conducted to compare the thermal insulation properties of the sugarcane composite board. The density of sugarcane composite board was low hence proved to be good insulators. All the samples were tested for physical and chemical properties.

Project Code:Env-03 (Team) (Jr)

Online ID:1582

Title: Alternative material to slow down the melting rate of ice butter paper

Name: Ms Aanchal Laxmikant Sharma & Ms Monal Rajes Takur Std: 8

Guide: Mrs Prasita Nair

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Ice has long been valued as a means of cooling. ice is needed in times of accident. It is used to reduce bleeding and pain . All time keeping an ice pack with you while travelling is a must. It is not always potable to carry cooler box during an outdoor trip .we need to find an alternative method for delaying of ice to a certain extent. Our project aims to study the effect of different wrapping material that can be used to keep ice from melting. Keeping ice covered with with aluminium foil , butter paper in light coloured box might also keep ice frozen .Theoretically the container covered with aluminium foil absorbs less radiation from the sun and thus the ice melts more gradually. 40 gm of ice was covered with sawdust and taken in a conical flask. At every five minutes interval the weight of ice was noted down. The same procedure was carried out with gelatin paper ,aluminium foil and butter paper. The experiments were carried out in replicates of 5 for each sample. Thus it can be concluded that the ice wrapped in aluminium foil and butter paper has insulating property hence delays the melting of ice which can be used as an alternative to cooler box while travelling Data was statistically analysed . Mean % of melting of Ice for sawdust was 10 ,for aluminium foil it was 5.2 ,for butter paper it was 5,and for gelatin paper paper it was 6.8 It was found that when ice was wrapped in aluminium foil and butter paper the remained without melting for a longer period of time It was found that when ice was wrapped in aluminium foil and butter paper the melting was delayed .he ice remained without melting for a longer period of time in aluminium foil and butter paper rather than gelatin paper.the time taken for melting in aluminium foil and butter paper was nearly

equal to the controlled sample. Thus it can be concluded that the ice wrapped in aluminium foil and butter paper has insulating property hence delays the melting of ice which can be used as an alternative to cooler box while travelling

Project Code:Env-04 (Team) Online ID:1583

Title: Cactus -A Natural Preservative

Name: Abhishek Ravindra Doke & Sahil Hemant Khobrekar Std: 9

Guide: Mrs Priti Attarde

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Edible coatings are thin layers of edible polymeric materials directly deposited or applied on the surface of food items such as fresh fruits and vegetables that can be eaten by the consumer as part of whole food product. The project aims at increasing the shelf life of fresh fruits and vegetables after they are harvested. An extract of cactus (cereus) is used as a natural preservative. Experiments were done on potato tubers, apple & The potato tubers were coated and stored along with uncoated potato tubers. Same was repeated for apples. They were periodically tested for different quality attributes like visual appearance, weight loss, pH, firmness and decay percentage. The results indicated that coated potatoes & apples showed reduced rate of weight loss, decay percentage compared with uncoated. Increased concentration of gel improved the quality of apples and potatoes. The weight loss of coated potatoes were only 10% compared to the control sample. control potato sprouting organically. The results indicated that shelf life of coated potatoes increased to 60 days compared to control (uncoated) ones which lasted up to 30 days while for coated apple it was 45 days compared to the control 20 days thereby offering a large advantage. Sensory evaluation results showed that coatings maintained the visual quality of the potatoes and apples during the storage time.

Project Code:Env-05 (Team) (Jr) Online ID:1625

Title: A LOW COST WATER TREATMENT BY USING A NATURAL FLOWERS ñ SHANKHPUSHPI

Name: Anushka Ravindra More & OM SANJAY GAIKAR Std: 7

Guide: VASUNDHARA DHANANJAY SINKAR

School: N M W S HIGH SCHOOL GHATKOPAR(W) MUMBAI

ABSTRACT:

Water is sacred in all religion. Clean drinking water is the majority remedy of all. water purifying methods for drinking purpose by employing few kinds of flowers, a traditional knowledge available in India from the classics of Ayurveda, the oldest system of medical practices. A simple method is designed to conduct a study for finding out the efficacy of the said method. In Ayurveda The flowers are being regularly used by people in different parts of our country as well as other countries

However, it is not known whether water is fully purified by this simple procedure. Therefore undertook the study to find out if shankpushpi flower could purify polluted water . Method•In the first phase, extract was made from Shunskhpuspi flower .2 grams of flowers were crushed using a mortar and pestle. Subsequently, the mixture was filtered to form extracts. •Water from three different areas were taken for experiment. •Five different concentrations of the stock solutions for the loading dose were prepared by measuring 5.0, 7.0, 9.0, 12.0 and 14.0 ml Shunskhpuspi flower separately into a beaker. The mixtures in the beakers were stirred. A 1000 ml water from 3 area were treated with with Shunskhpuspi flower extract and water without the extract was kept as control sample •The treatments given were the varying concentrations of shunakhpuspi flower extract, and the control Each treatment effect on the response (turbidity, pH, conductivity, total coliform counts) was repeated 4 times except the total coliform count which was carried out in triplicates.

Project Code:Env-06 (Team) (Jr)

Online ID:1638

Title: CLEANSING AGENT FROM RAW BANANA AND ORANGE PEEL

Name: Aryan Praful Bhor & Raguvir Kamalakar Sawant Std: 7

Guide: Mrs Rajeswari Nair

School: The North Mumbai Welfare Society's High School

ABSTRACT:

As evolutions are continuous, bacteria getting resistance against most of the antibiotics. This converted the minds of scientists towards plant extracts which are strong bacterial and viral inhibitors. Different parts of the plants were used for this purpose in the human history. The major reason of the use of plants in medicines is probably easily availability, economical and easy to use. Different parts of the plants are used for this purpose are gel, leaves, barks, roots, peels etc. In this project, peel of raw banana and orange peels are used to study the antibacterial of it in water extract and to make an eco-friendly cleansing solution. Various phytochemicals are present in the peels of vegetables and fruits. All these phytochemicals are reported to have multiple biological and pharmacological aspects such as antibacterial, antihypertensive, anti-diabetic and anti-inflammatory etc. the presence of these bioactive compounds emphasizes the medicinal importance of the peels. The fatty acids found in its peel are reported as antibacterial agents.

Project Code:Env-07 (Team)

Online ID:1710

Title: Plastic came now be recycled at home!

Name: Naitica Sanjay Darooka & Juhi Kothari Std: 9

Guide: Seema bajpai

School: Utpal Shanghvi school juhu

ABSTRACT:

Dissolving Thermocol Thermocol is the expanded form of Polystyrene which is a plastic very commonly used in its hard form as well as expanded into a foam which is generically known as Thermocol. This material finds wide usage in the packaging industry, model and craft industry as well as in the construction and insulation industry. Thermocol being high in volume, takes up a lot of space. Almost 50% of the landfills space is occupied by waste thermocol. It is highly flammable and on burning releases carcinogenic fumes. Thermocol is extremely light and floats on water resulting in it also becoming a choking hazard for river and sea creatures. A very useful material for sure but it comes with its set of hazards. The use of plastic has increased at a miraculous rate and so has its harmful effect. So it is extremely important to find a solution to this problem. Our experiment showcases an easy renewable as well as a simple method to reuse plastic at home. This experiment aims at degrading any polythene by immersing it into any hydrocarbon, may it be lemon oil or kerosene or nail polish remover, and using the product as an adhesive or mould it into any form. We've taken thermocol as the polythene and kerosene as the hydrocarbon. Since thermocol has a lot of air trapped in it, a large amount of thermocol is used in just little kerosene. Not only does the size of the Thermocol get reduced by more than 20 times, it can also turn into a clay like substance that can be reused for model making by dissolving in acetone and it turns into a great adhesive. The reaction happens immediately and a sticky liquid is produced. We kept this liquid in a sealed jar for a while and then moulded it into our desired shape. It was then left to dry. After it dried up, we used vibrant colours to paint it. An easily recycled object was made. This is extremely easy to do and doesn't even consume a lot of time. Anyone can do this anywhere and in this way, the deadliest effects of plastic are reduced.

Project Code: Env-08 (Team) (Jr)

Online ID:1771

Title: To study the effect of temperature on coated aluminium

Name: Chinmay Ganesh Phapale & Karna Krishnakant Bhosale Std: 8

Guide: Priya Rajwant Mishra

School: North mumbai welfare society's high school Mumbai

ABSTRACT:

Aluminium is the most abundant metal found on earth and has excellent resistance to corrosion. This strong resistance is due to the layer of oxide on the metal surface. Increasing the temperature while the humidity of environment remains constant will also increase the rate of corrosion. A higher temperature will stimulate the corrosion process by electro-chemical reaction taking place. The tests were done using coated aluminum plates (lemon juice, Ram Patta Extract, milk)

Project Code: Env-09 (Team) (Jr)

Online ID:1786

Title: Red Dragon Peel as Bio-Indicators for contamination/Adulteration of Water and Food

Name: SHRAVANI ANANT MAYEKAR & aVANTIKA RAVINDRA
DOKE Std: 7
Guide: VANITA A SINGH
School: NMWSHS Ghatkopar west Mumbai

ABSTRACT:

Acid-base indicators are organic dyes that change colours at different pH values. Most indicators that are used are synthesized from chemical reactions. As a result the chemical indicators used are expensive, Also not easily available for home usage. In our surrounding environment, there are some natural indicators present which are easily available and can be used as an alternative to these expensive indicators. Plants, flowers and fruits which have vibrant colours can be used as indicators as they contain chemicals from the naturally-coloured Anthocyanin family of compounds. Red Dragon Fruit peel interest in selection as, these days it is found that RED DRAGON Fruit has gained its popularity due to its different properties and health benefits. Dragon fruit juice has become a part of the menu at local juice centers too. It was observed that the peels which are red in colour are discarded as waste food material, So we decided to use these peel's extract as natural indicator to test different solutions for acidic and alkaline nature. From discarded Dragon fruit peel a paste is created by grinding them using the blender adding enough distilled water. This solution is further heated for 10 minutes stirring it occasionally while being heated. After cooling down extract is obtained by filtration. This extract is used as indicator to tests colour in different solution of different pH values. It was found that the solution acidic in nature gives pink colour where as alkaline solution turns into faded light pink colour and strong alkali changes to yellowish green. Thus we conclude that Red Dragon fruit peel can be used as an alternative to universal chemical indicators. Further it can be used as an indicator to water pollution and also to find the presence of different hazardous food additives used in food adulteration.

Project Code:Env-10 (Team) (Jr)

Online ID:1826

Title: Bio-Moring-Char Magic Aqua Purifier [BMC Magic Aqua Purifier]
Name: NAIR SOORAJ SREEKUMAR & MRIDUL DILIP NAMBIAR
Std: 8
Guide: DR SEEMA MISHRA
School: SIES HIGH SCHOOL MATUNGA MUMBAI 400019

ABSTRACT:

Abstract:Our country over the past decade has witnessed acute water shortage. Most of the water sources of drinking water have either dried off or are polluted. Raw water resources available have to be purified to make it potable. Most of the rural population depend upon underground water resources like well, bore wells, small tanks and ponds for their daily requirement of water for cooking and drinking. Purification of raw water from these sources often exhibit expensive and

energy consuming methods when employed on a large scale or centrally. Availability of continuous energy cannot be ensured in the rural areas. There also exists a challenge of supplying the purified water to each and every household in the rural area if purification of water is done centrally. Impure water leads to water borne diseases. This necessitates the requirement of a water purification method that does not consume energy and can be easily installed. The purification facility should be made available effortlessly to every house hold and must be economical. Powdered seeds of Moringa Oleifera [Drumstick] tree and Bio-char are found to have extensive inherent property of water purification through the methods of Coagulation, Filtration and are also seen to have the capability to remove TDS and TSS. This abstract highlights the dual water filter combination - Powdered seeds of Moringa Oleifera [Drumstick] & Bio-char and depicts a simple method to purify water. In addition this paper also mentions about the Bio-mass that's left after the purification of water, which can be used as a natural nutrient to the soil to enhance plant growth and sequestration of CO₂ which contributes in mitigating climate change.

Project Code: Env-11 (Team) (Jr)

Online ID:1872

Title: Innovative way of making adhesive using hibiscus leaf gel

Name: Aditya Dangat & Akash Mungala Std: 8

Guide: Mrs Manisha Rajath

School: The N M W S High School Rifle range Mumbai

ABSTRACT:

The objective of the study is to characterize and evaluate the leaves of Hibiscus (Hibiscus rosasinensis) mucilage as Adhesive. The mucilage is extracted using distilled water and isolated by acetone. The viscosity of the extracted mucilage was evaluated. The result shows that the extraction of mucilage with water has excellent flow properties. Various phytochemical tests show that carbohydrates and amino acids were only present. These tests indicate the purity of the mucilage. The extracted mucilage was treated with different binders like soy powder, corn starch and wheat flour to check the suitability as an adhesive. The results showed that the adhesive made from Hibiscus rosasinensis mucilage can be a substitute for the commercially available adhesives but can only be used for paper sticking.

Project Code: Env-12 (Team) (Jr)

Online ID:1880

Title: Making Edible biodegradable serving utensils/cutlery

Name: Priya Satyanarayan Samanta & Atul Pramod Mahajan Std: 8

Guide: Nalini Nainar

School: NMWS High School Rifle Range Ghatkopar W Mumbai

ABSTRACT:

One of the greatest symbols of our throwaway society only next to plastic bags is the plastic fork, knife, spoons, plates and cups that is used by everyone. Also the

original intention of plastic utensils of being disposable makes its ultimate destination the trash can. They are just used at will and then thrown away. With passing time, India has seen an increase in the use of plastic that not only causes huge environmental problem but also is a health hazard. We may reason that as long as the plastic we use is BPA (Bisphenol A) free we are safe but that's not the case. Research states that out of the 400 chemical compounds that are used to make plastic, a small number have been tested. There is a fair chance that other chemical compounds that haven't been studied and analysed are not safe. What about that? The project aims at providing an alternative to plastics. The utensils that are made using millet flour and banana flower have the potential of not only replacing plastic but also providing some add-on nutrition to the user. These utensils certainly are biodegradable and the thought of such eating tools is more than simply intriguing.

Project Code: Maths-01 (Team) (Jr) Online ID:1585

Title: Eratosthenes prime series and its applications in day today life

Name: Mst Rohit Yadav & Mst Divya Jitendra Sheth Std: 8

Guide: Mrs Rajeswari Nair

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

Aim of this project is to study about the SIEVE OF ERATOSTHENES IN CRYPTOGRAPHY FOR CREATING PASSWORDS. The world today is facing the major problem of hacking of credit cards and other confidential documents. The data stolen by hacking is leading to many malpractices in the entire economy. To overcome this problem, we have come up with a solution to protect the passwords and other confidential data from hackers. We have used "The Prime series method of Eratosthenes". Eratosthenes was a Greek mathematician who invented a method of finding Prime numbers up to a certain limit. Two primes yield a unique product, a concept used in electronic money transactions. The public key (say, the 16 digit credit card number) represents one prime number while the private key (say, the 3 digit CVV code) the other prime number. The server knows the 'product of the two primes' i.e. public key converted to a prime 1 x private key converted to prime 2. Prime 1 and Prime 2 are not visible but are encrypted from the respective public key and private key. As our tech for securing credit cards has increased, the tech for hackers has also increased. Several cases of credit cards being hacked occur almost every day. As a result, there is a need to further upgrade our guard against the prevailing community of hackers

Project Code: Physics-01 (Jr) Online ID:1875

Title: Effect of string thickness and plucking position on harmonic properties of notes played on guitar strings

Name: Antara Raaghavi Bhattacharya Std: 8

Guide: Arnab Bhattacharya

School: G D Somani Memorial School Colaba/Mumbai

ABSTRACT:

Multi-stringed plucked musical instruments like the guitar, sarod, sitar etc. have strings of different thickness and materials. One can play the same note on different strings using different fingering positions to adjust the length appropriately. However, these notes, though same, sound slightly different to the trained ear. Also, depending on if the string is pressed with the finger or a “capo” the note sounds different. The strings are usually plucked directly above the sound box, but plucking at different positions also changes the character of the note. My project aims to systematically study the differences in the same note played on different strings of an acoustic guitar, and also under varied styles. I have recorded such notes and analysed the frequency spectrum (using Audacity software) and compared the nature of the harmonic overtones present. There is a large variation in the relative strength of the harmonics when the same note is played in different ways. I also want to compare a plucked string on a guitar with a stretched string not on the guitar body to check the effect of the instrument body on the selective damping and amplification of harmonics. This project utilizes a relatively simple experiment that makes learning frequency analysis interesting, demonstrates the complexity of real world musical instruments compared to a stretched string, and provides useful information for musicians, since such frequency analysis of a recording can tell not only just which note, but which string was played.

Project Code:Tech-01

Online ID:1569

Title: Throwable Gas Sensor For Emergency And Rescue Workers

Name: Sarvagnya Hrishikesh Purohit Std: 9

Guide: x

School: A K Joshi English Medium School Thane(West)

ABSTRACT:

Gas Sensors are being used for various tasks often as a part of a safety protocol in the industries and oil rigs. They also become handy for firefighting. They detect various combustible, flammable and toxic gasses and even oxygen depletion. There are portable gas sensors developed too. The environments in which these gas sensors operate share several problems. As the sensors during tragedies are in a confined space, they won't allow the rescuers to enter the confined space and read the readings of the gasses. Hence, they need wireless gas sensors which are too costly. Next, the rescuers need the information of the density of the potentially hazardous gasses so that they can start the rescue in the more dangerous areas and save lives. But they often fail in these tasks and as a result, many lives are lost. Keeping all these problems in my mind, I aimed to create a faster, simpler and more practical method of reading the density of atmospheric gasses in the confined spaces during tragedies and remotely receive those readings. I designed a cheap,

lightweight, ball-shaped, disposable, throwable gas sensor which can be thrown into the confined space during tragedies and the user can remotely receive the reading on a receiver and start the rescue. The device was successful and effective in its task and could now be used in such rescues. Link for the video of the working project : https://www.youtube.com/watch?v=TBki7H_jPzA

Project Code:Tech-02 (Team) Online ID:1579

Title: APP FOR HOME AUTOMATION

Name: Gautam Gopal Vishwakarma & Advait Ajay Ramane Std: 9

Guide: Mrs Rajeswari Nair

School: North Bombay Welfare Society High School Mumbai

ABSTRACT:

This project emphasizes on developing an app which will command home appliances with the help of Arduino and DTMF decoder. The Arduino will be programmed with the help the Arduino IDE. On the user's command the Database will get updated and the same update will be picked up by the receiver app. The receiver will send a tone to the DTMF decoder which will convert it into binary code. The programmed Arduino will be connected to the DTMF decoder. The DTMF decoder will send the binary code to the Arduino and the Arduino will control the appliance. Numerous apps have been created already which control appliances, but all of them require some kind of add-ons like IR blasters or Bluetooth receivers. In our project, we only utilise the Internet so that everyone can use it. Both apps were functioning properly and their combination resulted in the development of a wireless control system for home appliances. The system could not function in the absence of an Internet connection

Project Code:Tech-03 Online ID:1810

Title: EyeScribe

Name: Gursimran Singh Std: 11

Guide: Sangeeta Malhotra

School: Amity International School Sec-46 Gurgaon

ABSTRACT:

This world is full of precarious elements in life where every being is looking for a hope so as to see a silver lining in the sky and needless to opine, Engineering is a hope. A hope for a better tomorrow, and the tomorrow can be better only if the existing uncertainties are addressed properly. EyeScribe is the engineering marvel which solves various day to day problems and serves the purpose of Innovation I.e. Simplifying lives. Today, we are living in between two eras- one is traditional and the other is the Digital era. We are often jostling between the two and this results in problems: one among them being whether we write or we type? Well, both of them are requisites, but the problem arises is when you have to type the same content you have written earlier, and let's be honest, that's annoying too.

EyeScribe solves this problem. It is a wearable eye device which smartly converts handwritten notes into digital, editable text. Also, EyeScribe is specially designed for the Visually Impaired. EyeScribe reads Braille and converts it into audio which can be directly sent to their ears. Not only this, EyeScribe can save your scripts for you to read them when you want to. It can be connected to almost all devices so that you can read your script while you are at the worktable, or while you sit back and relax. EyeScribe has a UV Distance Sensor. For the blinds, it produces a beep at the minimum distance threshold to warn them so that can stop and prevent the bump in their head. This is EyeScribe for you. A device to cope up with your expeditious lifestyle.