

# MODEL CONFERENCE OF PARTIES 5 ACTION PLAN<sup>ol</sup>

July - August 2024

**School Name:** Gitanjali Vedika School MCOP5

**Target:** Plan and implement a community-wide recycling program, in partnership with institutions, RWAs, and local recyclers.

Students with the help of teachers/school authorities

**PRINCIPAL -SONIA NAGPAL**

**Coordinator teacher** - shalini rachakonda

**Students list**

Jaasmitha Paduchuri Nyas Nikhil Dhume Rida Fatima (H) Shreshta V S (H) Jaideep Vottikonda

## GLOBAL WARMING

The increasing levels of greenhouse gases in the atmosphere are a major cause of global warming. Carbon dioxide, methane, nitrous oxide, and fluorinated gases are some of the most potent greenhouse gases. These gases are released through human activities such as burning fossil fuels, deforestation, and land-use changes.

Human activities such as burning fossil fuels, deforestation, and land-use changes are significant contributors to global warming. The burning of fossil fuels such as coal, oil, and gas for energy releases large amounts of carbon dioxide into the atmosphere. Deforestation and land-use changes, such as the conversion of natural habitats to agricultural land or urban areas, also lead to the release of stored carbon.

Agriculture is another significant contributor to global warming. The production of meat, especially beef, and other animal products leads to the release of methane and nitrous oxide. Industrial processes such as cement production and steel manufacturing also release large amounts of greenhouse gases.

Population growth and consumption patterns are also driving global warming. As the global population grows, so does energy demand, leading to increased greenhouse gas emissions. The increasing demand for energy-intensive goods and services, such as air travel and meat consumption, also contributes to greenhouse gas emissions.

Feedback loops are also exacerbating global warming. For example, the melting of Arctic ice exposes darker surfaces that absorb more solar radiation, amplifying warming. Similarly, the thawing of permafrost releases methane, a potent greenhouse gas, creating a self-reinforcing feedback loop.





**CONSEQUENCES** The environmental consequences of global warming are severe and far-reaching. Rising sea levels, caused by melting glaciers and ice sheets, lead to coastal erosion and flooding. Extreme weather events, such as heatwaves, droughts, and heavy rainfall events, are becoming more frequent and intense. Water scarcity is also a major concern, as changes in precipitation patterns and increased evaporation due to warmer temperatures lead to droughts and water shortages.

Global warming also has devastating consequences for human health. Heat-related illnesses and deaths are on the rise, as are respiratory problems, such as asthma, exacerbated by warmer temperatures and altered air quality. Vector-borne diseases, such as malaria and dengue fever, are also spreading more widely, as changes in temperature and precipitation patterns create ideal breeding conditions for disease-carrying insects. Furthermore, the mental health impacts of global warming should not be underestimated, as the stress, anxiety, and trauma caused by the consequences of global warming can have long-lasting effects.

The economic consequences of global warming are also significant. Damage to infrastructure, such as roads, bridges, and buildings, caused by rising sea levels and extreme weather events, is estimated to cost trillions of dollars. Loss of productivity, particularly in agriculture, is also a major concern, as warmer temperatures and altered ecosystems impact crop yields and food security. Additionally, the health consequences of global warming lead to increased healthcare costs and lost productivity.

The social consequences of global warming are far-reaching and devastating. Mass migration and displacement, caused by rising sea levels, more frequent natural disasters, and decreased livelihood opportunities, are becoming increasingly common. Social inequality is also exacerbated by global warming, as the impacts disproportionately affect vulnerable populations, such as the poor, children, and the elderly. Furthermore, cultural heritage sites and historical landmarks are threatened by rising sea levels and increased frequency of extreme weather events.

### **Early Indicators**

1. 1795: James Hutton, a Scottish geologist, proposes that the Earth's temperature may be increasing due to human activities.
2. 1827: Joseph Fourier, a French mathematician and physicist, discovers the greenhouse effect, which explains how certain gases trap heat in the atmosphere.
3. 1896: Svante Arrhenius, a Swedish chemist and physicist, calculates that human activities, such as burning fossil fuels, could increase global temperatures by 5-6°C.

## Initial Observations

1. 1930s: Gilbert Plass, a Canadian physicist, observes that the Earth's temperature has risen over the past few decades.
2. 1950s: Roger Revelle and Hans Suess, American scientists, demonstrate that human activities are increasing atmospheric carbon dioxide levels.
3. 1960s: The first computer models of the climate system are developed, predicting that human activities will lead to global warming.

## Official Recognition

- 1 1979: The First World Climate Conference is held in Geneva, Switzerland, where scientists officially recognize the threat of global warming.
2. 1988: The Intergovernmental Panel on Climate Change (IPCC) is established to provide scientific advice to policymakers on climate change.
3. 1992: The United Nations Framework Convention on Climate Change (UNFCCC) is signed at the Earth Summit in Rio de Janeiro, Brazil, marking a global commitment to address climate change.

### Our School's approach towards it:

Our school has taken a proactive approach to combating global warming. We recognize the importance of reducing our carbon footprint and promoting sustainability for the benefit of our students, staff, and the wider community.



We organized a rally from Gitanjali Vedika School to Big Basket Mart, Manikonda, to raise awareness about the harmful effects of plastic pollution. Students carried placards with slogans like “Don’t be drastic say no to plastic” and “We want evolution and more pollution”.



Chanting slogans, we encouraged onlookers to adopt eco-friendly alternatives like cloth bags and steel containers. The rally aimed to inspire the community to reduce single-use plastics and take steps toward sustainability, leaving a positive impact on everyone involved.



## Green School Activity

Interactors went to each and every class and explained about the importance of reducing the plastic. They suggested the children carry steel bottles instead of plastic water bottles and steel lunch boxes. They also explained the importance of segregation of wastes into dry and wet wastes.



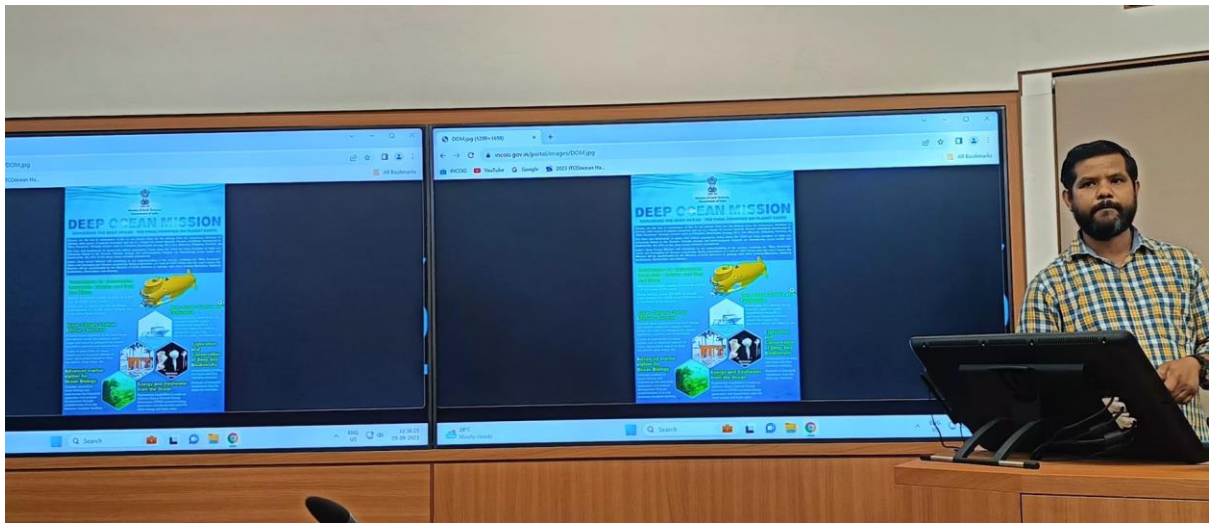
## Collaborated with Goonj for Donations

Gitanjali Vedika Interactors collaborated with Goonj for collecting donations from parents to help people of various places of India suffering due to floods.



## Social Science Exhibition

During the social science exhibition at our school, As a part of NDRF Relief activities interacted with the parents who visited the exhibition and explained about importance of donation and about donations collected by collaborating with Goonj.







## **Our innovations to wide recycling program**

### **REPLACE THE PLASTIC BECAUSE IT ISN'T FANTASTIC (E-coir bag)**

Sustainable development is one of the most important issues in the world today. The primary objective of sustainable development is to raise living standards without using more natural resources than the environment can sustainably provide. It is necessary to implement several eco efficiency principles, such as lowering energy and material consumption, reducing service intensity and hazardous dispersion, recycling materials, and enhancing product durability. Plastic bags are difficult and costly to recycle and most end up on landfill sites where they take around 300 years to photodegrade. They break down into tiny toxic particles that contaminate the soil and waterways and enter the food chain when animals accidentally ingest them. This is not just it, block the drainage, affect the animal life and all the life existing on earth. AIM; Replacing plastic bags for the saplings

Materials; Coconut coir, Corn cob , Sugarcane bagasse, paper, wood shavings, Any material that is a part of common waste and serves as a fertiliser to plants But in this, we have used the above mentioned as main.

### **Procedure**

It all starts by grinding the materials together to form a paste. Make it in the shape of a container and keep it aside to cool it down. It is now hard to be able to hold the plant sapling just enough to replace the harmful plastic bags.

What are actually the harmful effects of plastic bags and to what extent can they be so?

Plastic bags are difficult and costly to recycle and most end up on landfill sites where they take around 300 years to photodegrade. They break down into tiny toxic particles that contaminate the soil and waterways and enter the food chain when animals accidentally ingest them. This is not just it, block the drainage, affect the animal life and all the life existing on earth. The benefits or uses of using the coconut coir, corn cob and sugarcane bagasse in this could be Coir

It helps to improve soil's drainage while still retaining moisture. Since the coir breaks down, it creates air pockets in the ground that not only helps extra moisture to drain away from the roots. Since they don't stay too moist, thus, also allows oxygen to get to the roots. Corn cob

Essentially, corn cobs are excellent for your garden. They serve as a source of fertilisers and also provide an extra and unique service. So, before you throw those corn cobs in the waste bin next time, think about composting them first.

Sugarcane bagasse are also natural fertilisers that serve the same purpose. The materials

coconut coir = 0

Corn cob = 0

Sugarcane bagasse = 0

The cost of the biodegradable adhesive -

PVA glue will range from 250 Indian rupees.

Out of these 54 coir bags are made.



## **2) RECYCLED RUBBER TO REDUCE NOISE POLLUTION - ABSTRACT Scope of our project**

The aim of our project is to reduce noise pollution using rubber.

Problem Statement

Noise pollution is defined as any disturbing or unwanted noise that affects or deteriorates human life. Although noise constantly surrounds us, noise pollution generally receives less attention than, for example, water quality and air quality concerns, because it cannot be seen, tasted or smelled. Nonetheless, it is an indisputable fact that noise has a negative impact on everyday life especially if we observe urban areas. One of the main sources of noise is traffic. Our project works on reducing the

same with efficient means.

### **Proposed Solution**

While there is an extensive range of solutions for water and air pollution, after our research, we found

that Noise pollution is a field that remains vastly untouched. One solution that is used today to prevent noise pollution, is noise barriers. Noise barriers can be defined as a certain sound “obstacle” between the sound source and the observer. Conventionally, noise barriers are made of materials such as wood,

metal, glass, cement and plastic. Our idea is to use recycled rubber obtained from local industries to make noise barriers. At present, rubber is used in indoor areas for acoustics, but not outdoors. There are many properties that make rubber suitable for this. It has great acoustic properties, i.e., it absorbs sound

well. Rubber, at present, is used for acoustic purposes in indoor areas. It is extremely cost effective.

Rubber, on the whole is comparatively cheaper than conventionally used materials for noise barriers.

Recycled rubber is even more so. It is durable and can withstand extreme weather conditions. Being recycled, our material is sustainable and eco-friendly. Our main target locations are highways and railway tracks.

### **Principals used**

- a. Deflection and absorption of sound waves by noise barriers.
- b. Acoustic properties of rubber

### **Other Applications**

In the future, the applications can be widened with experimentation to cater to places such as party plots

and residential compounds.

### **3 GREEN ALGAE TO BIOFUEL - ABSTRACT**

## Scope of our project

The aim of our project is to obtain biofuel from green algae.

## The problem statement

We saw many ponds filled with green algae near our locality. This was not only making the environment stingy and unbearable for the people living around but was also killing the aquatic ecosystem so we thought of making biofuel from algae.

## The hypothesis

We pondered and researched on different ways of how can we cultivate algae and how algae can be used to make biofuel. And we found that by adding certain chemicals like n-hexane, and baking soda we can activate algae to produce biofuel from its lipid layer and other bi products.

## The objective

The objective of our project is to cultivate algae in a controlled manner and extract biofuel from it along with four more bi products. On one hand it consumes  $\text{CO}_2$  and on the other it emits lots of  $\text{O}_2$

in the atmosphere. Also it generates biofuel which can be used as an alternative for fossil fuels.

## Methodology

So we created an Omega structure model to cultivate algae. In a reservoir we collected industrial waste

water which passes through floating structure on the waterbody. Industrial wastewater contains magnesium sulphate, carbon dioxide, and nitrate which gives favourable condition for algae to grow

rapidly. Also closed pipe keeps it contamination free. This floating pipe gives algae perfect temperature  $25\text{--}30^\circ$  Celsius with electromagnetic waves. After 2 weeks when algae is fully grown, it

goes to another container where we filter it. Collected algae is mixed with hexane and sodium bicarbonate in 10:1:1 ratio. After that we grinder it and left it for 24 hours to settle down on the upper layer. Once we get oil surface we can collect it in another container with the help of decantation method.

## Observation

We observed our mixture for 24 hours and found a layer of bio fuel(floating) over the surface of the container and filtered and separated it.

This obtained biofuel can be used in bio and Chemistry laboratories

## Conclusion



1. By the above experiment we found out that from 500 grams of algae, 50 ml of bio fuel can be obtained.

2. Also 4 other byproducts can be obtained like organic fertilizer, cosmetics, Electricity and fish feed.

#### Limitation

This bio fuel can only be obtained from green algae.

#### Practical implications of the project

In Chemistry lab, and Bio lab on the place of spirit lamps this biofuel can be used. If produced on large scale it can be a perfect alternative of Fossil fuel.

### **4) Natural Fruit ripening device**

Nutritionists advise eating fresh fruits daily to draw essential vitamins & minerals from them. However, the health benefits do depend on the way these are grown or ripened. Naturally matured fruits and vegetables contain maximum nutrients to promote well-being. However, due to increasing demand, the practice of artificial ripening is on the rise which is alarming. Calcium Carbide is a very harmful chemical for it. It contains traces of Arsenic and Phosphorus, and when it reacts with water it produces gas (popularly referred to as Carbide Gas) Consumption of Carbide ripened fruits may cause several harmful effects to both as Calcium Carbide has carcinogenic properties. It may affect the neurological system by inducing prolonged hypoxia which causes headache, dizziness, mood disturbances, sleepiness, mental confusion, memory loss, cerebral edema and seizure.

We have come up with a natural fruit ripening Device that will help us solve this problem. First we need to take 2 boxes which should be identical and of the same length, breadth and height. In both the boxes we must make a hole which should be of 1 cm. and after that we must attach pipes and insert pipes from one box to another box. and after that you need to name the boxes, you can name the boxes A and B. In box A you can put fruits and peels of vegetables and in box B we can put raw fruits and vegetables. Due to the decomposition of fruits and vegetables, ethylene gas is produced, ripen the fruits naturally.

#### Budget

##### The materials

2 boxes - Reusing the old boxes

Pipes- 80 Rupees

Decomposed materials of vegetables and fruits - from the school cafeteria (collected waste)



## 5) COST EFFECTIVE TABLET TO PURIFY SEWAGE H<sub>2</sub>O.

Pharmaceutical packaging has come a long way, from stone jars to plastic and glass containers. One type of packaging, called blister packaging, has the most widespread usage around the globe. These are excellent in isolating the pharmaceuticals from gases and moisture. But such kinds of packaging have also caused detrimental effects to the environment, and after use, end up in landfills. With increasing use of medication, means an increase in use of such packaging, leading to more landfills as each day passes. Therefore, it is important that technology should be developed to prevent environmental pollution. SCIENTIFIC PRINCIPLE

Coagulation is a primary and cost effective process in water treatment plants. Under optimum conditions, not only it effectively removes turbidity but also results in reduced sludge volume and subsequently minimizes sludge management costs. Highly turbid water from streams, canals, rivers and rain run offs was run through jar test for turbidity removal. The brown water with 250NTU turbidity when coagulated with alum and assorted coagulants proved that maximum turbidity removal was witnessed using alum dose of 0.25 g/l at pH 6 with a sedimentation time of 30 min In water, aluminium salts hydrolyse and give a variety of

products including cationic species, which can adsorb on negative charged particles, and thus neutralize their charge. The particles get destabilized and aggregation occurs Solution Proposed

Blister packs collected from students and teachers from our school, were first weighed on a digital scale and then treated with a solution of KOH. The aluminium blister pack was allowed to dissolve completely in the solution. The potassium aluminate solution is heated and then cooled. Dilute H<sub>2</sub>SO<sub>4</sub> is added to the solution drop by drop, until all the precipitate completely dissolves which is later heated for 3 to 4 minutes and is transferred to a crucible kept in an ice bath, which immediately starts to form the potash alum crystals and is weighed using a digital weighing machine.

Our research helped us to prepare potash alum for water purification which in turn help in the recycle of blister pack in a cost-effective manner. The prepared alum was used for flocculation test.

## Conclusion

Our product provides an eco-friendly, alternative, low-cost water purification method, and would be effective in cleaning landfills as well as contaminated water sources. UNIQUE FEATURE OF THE EXHIBIT

1) When wastewater is not treated properly, it can pollute our water sources, damage natural habitats, and cause serious illnesses. Effectively, wastewater treatment plants do as describe; they treat the water that goes down our drains before discharging it back into the environment.

2) Reduces labour efforts

3) Cost effectiv

## 6) Fire Resistant paint

### FIRE RESISTANT PAINT

Ash is the solid, somewhat powdery substance that is left over after any fuel undergoes combustion. Broadly speaking, coal ash and wood ash are the two most talked about types of ash, although ash is created during any process of incomplete combustion. Due to the variety of potential fuels, the chemical composition and even appearance of ash can vary drastically. Composition of wood and coal ash

Wood- calcium, potassium, manganese, and sodium.

Coal- oxides of silicon, aluminium iron and calcium, magnesium, potassium, sodium, titanium, sulphur

### ACROSS INDIA

Incident	Location	Date	Cause Causalities
Kamala Mills	Mumbai	28th December 2017	hookah 14 deaths
Plastic Factory	Ludhiana	20th November 2017	hazardous 13 deaths chemicals.

Snack Shop	Mumbai	18th November 2018	Explosion of 12 deaths gas cylinders
Rohini Hospital	Telangana		Cylinder 199 admitted, 2 deaths leakage in operation theatre
Scrap Market	Kota	19 July 2017	Electrical 2 deaths, 15 admitted short circuit which caused explosion of five cylinders

#### ACROSS THE WORLD

Incident	Location	Date	Cause Causalities
The Great Chicago On Fire	Chicago, Illinois, USA	October 8 to 10, 1871	Unknown Estimated 300 deaths
Deep water horizon fire	Coats of Louisiana, US	April 20 to September 19, 2010	Explosion in 11 deaths fire well



Haryana

school blaze

District Sirsa, Haryana, India

23 December 1995

Short Circuit 500 deaths

Chini Zhili toy factory fire	City of Shenzhen, China	November 19, 1993	Supposed to be More than 100 deaths fault in the machinery
The triangle shirtwaist fire	New York City, USA	March 25, 1911	Unextinguished Cigarette Butt 146 deaths

-----

Every decade, about 5,000 people die due to fire accidents. To solve this recent problem that kills hundreds every year, we neither require advanced technology nor high budget schemes. All we need is the thing that we think of as waste but in fact this “waste product” could save hundreds of crores of rupees and lakhs of lives in the next century. It is nothing but ash, the residue, the part of the oxidised substance that was left unburnt due to absence of oxygen.

As we already know ash is one of the most common industrial waste that is produced by various industries i.e when power companies are going to burn coal there is a huge amount of ash that is going to be produced everyday which can be harmful to the environment. In order to understand exactly how this works, we need to understand the properties of ash, which is primarily made up of oxides of silicones, aluminium, iron and calcium. It also consists of magnesium, potassium, sodium, titanium and sulphur but in lesser amounts.

Another important characteristic of ash is that it is considered to smother fire which means that ultimately it can be used to extinguish fire. By using this property we can reduce the number of deaths and issues that we are facing due to the increasing fire accidents around the globe and as we all know, we already use CO<sub>2</sub> as an extinguisher, so instead we can use it to make 'fire resistant paint.'

Now, how do we make this, 'fire resistant paint'. When we add ash into paint and use it to paint the different kinds of buildings specifically speaking about apartments, houses, offices and much more, it will act as a protector against fire. In this project we have used cardboard, paint and the main component, ash. The ratio of ash and paint is 3:4. Now when we test it, it does not catch fire. And thus this principle can be used as a fire resistant paint.

The unique feature of this paint is that it is affordable because it is made up of materials that can be easily found and is accessible to all. Another distinctive feature of this paint is that it is eco friendly and sustainable as it is made up of recycled material, the utilisation of ash reduces the requirement of clay, sand, limestone in paint manufacturing, hence, this is not only saving lives but also, saving natural resources.

## **7) Biomass energy conversion**

Converting plant waste into electricity is a process commonly known as biomass energy generation. Biomass energy utilises organic materials like agricultural residues, wood, and other plant waste to produce electricity through various methods.

The organic material here should be prepared properly which might involve processes like shredding. The material needs to be dried for increased combustion efficiency. Fun fact- solar power could be the world's top power source by 2050

Methods to use the obtained material

Combustion

Biomass is heated directly to produce heat which is used in steam engines for running turbines.

Gasification

"Syngas" is produced by burning biomass in a chamber with very low oxygen levels. Syngas can be directly used for power generation

Pyrolysis

Biomass is converted into bio-oil and biochar by thermal decomposition. Bio-oil can be used for energy generation whereas biochar can be used for soil nourishment.

To make a chamber we might need around 1935 Indian Rupees.

Remaining biodegradable waste will be collected from school and the nearby societies.



### 8) Kefir the magic drink

Lactose intolerance

WHAT IS IT?

Partial or total inability to digest lactose, caused by deficiency of the enzyme lactase. WHAT DOES IT DO?

May result in abdominal pain, bloating, and diarrhoea after consuming milk and other dairy products

WHAT CAN WE DO?

You can take lactase tablets before you eat or drink milk products. You can also add lactase drops to milk before you drink it. The lactase breaks down the lactose in foods and drinks, lowering your chances of having lactose intolerance symptoms. Check with your doctor before using lactase products.

- Put kefir grains, about 2 teaspoons of grains, into a clean glass jar with about 3 cups of fresh milk.

...

- Place a plastic lid on top of the jar, but do not tighten it.

- Place the jar in a warm place, out of direct sunlight, for 24 hours. You will know your kefir

is done when it has slightly thickened and smells fermented.

- Tighten the lid and shake well

Place a stainless-steel strainer or plastic strainer over a clean jar. Strain the kefir into the jar. It's made using live cultures called kefir grains. If you want to grow kefir grains of your own, acquire some active grains and then multiply them by fermenting several batches of kefir consecutively.

Once your grains begin to multiply, keep going until you have a sufficient amount of kefir grains for your purposes.]

An important note ; It's important to note that the degree to which kefir can help with lactose intolerance can vary from person to person. Some individuals with severe lactose intolerance might still experience symptoms when consuming kefir, while others may find substantial relief. If you're considering adding kefir to your diet to manage lactose intolerance, it's a good idea to start with a small amount and observe how your body reacts. If you have concerns or experience persistent symptoms, consulting a healthcare professional is recommended.



9)Poor man's

#### **pot**

- The main use of a poor man's pot is to purify the water.
- It is an eco-friendly device that can be made using materials that are clay pots, activated charcoal and chlorine.
- Drinking contaminated water can cause many diseases like cholera.
- Poor man's pot can be used in these Rural areas to purify the water as it is low cost and easy to make.

It is made by stacking three clay pots one on top of the other and are connected. In the first pot there is an opening at the top so that water can be added. There is also a layer of activated charcoal at the bottom. Then the water is passed into the next pot where there is chlorine. After this the water is passed into the final pot where we can store the filtered water. We can aThis device can help in purifying the water by removing sediment, volatile organic compounds and viruses. It mostly helps people in Rural areas that cannot afford to buy water filters. This device can be made using the materials that can be found easily and of low cost. If people start using this



diseases that are caused due to contaminated water will be reduced. Add a tap as well so that we can easily use the water

Budget

Cost of chemicals

Potassium chloride-119 Indian Rupees

Alum- 59 Indian rupees

Activated charcoal - 200 Indian Rupees

Clay - 244 Indian Rupees

Total- 620 (approx.) for 50 pots



### 10 Pollution reduction device

- The rapid development of vehicles has significantly increased the concentration of greenhouse gases such as carbon dioxide, methane, hydro fluoro carbons etc. in the atmosphere .The greenhouse effect of these gases leads to environmental pollution exacerbates global warming, raises ocean water levels and increases the acidity of water thus, affecting the balance of the ecosystem .
- Among these problems the major one is that these harmful gases cause respiratory disorders when we breathe.Since we know how harmful it is to live in an environment full of these toxic gases, reducing their toxicity is the need of the hour.

- So, we have designed an inexpensive device that can reduce the toxicity of these harmful gases released from vehicles. The device is eco friendly, bio degradable and helps to reduce the problem of air pollution.

BUDGET IS ZERO

SCIENTIFIC PRINCIPLE-

- In our device we make use of activated charcoal made of coconut shell and its property of adsorption. Activated carbon, also called activated charcoal, is a form of carbon that has been processed to make it extremely porous thus to have a very large surface area available for adsorption. When a material adsorbs something, it attaches to it by chemical force of attraction. The huge surface area of activated charcoal gives it countless bonding sites. When certain chemicals pass next to the carbon surface, they attach to the surface and are trapped. This is how the chemical toxicity of harmful gases from vehicles can be reduced to an extent with activated carbon.
- One of the ways for activating carbon is through coconut SHELL. Activated carbon was prepared from coconut husks using a physicochemical activation method which consisted of potassium hydroxide (KOH) treatment and carbon dioxide (CO<sub>2</sub>) gasification. PROCEDURE-
- Since we wanted our device to be portable and affordable by all, the design of it is very basic, we have narrow pipe of a non-corrosive metal connected to the exhaust of the vehicle which further extends to divide up into 4 thinner tubes of the same material, opening in the surroundings.
- Nature is facing problems, we can't afford any more damage to it, so we decided to utilise the power of reuse and recycle, and turned the seemingly waste coconut shell and into activated charcoal granules.
- We fix a long piece of charcoal(activated carbon) in the main tube in a way that, the air from the exhaust has to pass through the piece without any leakage. As the percentage of toxic gases in the exhaust is very high it is very important to reduce them.
- When gases like carbon monoxide and HFCs come in contact with this activated carbon in the main tube, they adsorb to it and the remaining part of the air moves on to the further tubes. . ➤ Since one piece of charcoal won't be able to adsorb all of it, this is where the smaller tubes come into play, these thin tubes are lined with smaller granules of activated carbon, so even the minute amount of chemical toxins will be adsorbed
- Due to its high degree of microporosity, one gram of activated carbon has a surface area in excess of 3,000 m<sup>2</sup>. So the device can be used continuously for a long period without any problems of replacing. Even if it is blocked, it can be cleaned and used again. This is a highly cost effective, simple device.



## 11 CO detector

carbon monoxide, (CO), a highly toxic, colourless, odourless, flammable gas produced industrially for use in the manufacture of numerous organic and inorganic chemical products; it is also present in the exhaust gases of internal-combustion engines and furnaces as a result of incomplete conversion of carbon or carbon-containing fuels to carbon dioxide carbon monoxide poisoning, often fatal condition resulting from inhalation of carbon monoxide, frequently occurring in association with inhalation of smoke or automobile exhaust. Haemoglobin, the oxygen-carrying substance in blood, has a much greater affinity for carbon monoxide than it has for oxygen, and together they form a stable compound, carboxyhemoglobin, that decreases the amount of uncombined haemoglobin available for oxygen transport. Treatment must be prompt and includes respiratory assistance and the administration of oxygen, often with 5 percent carbon dioxide and sometimes under high pressure.

The CO detector includes an Arduino uno, A MQ7 CO sensor, A display, a buzzer and a couple wires. This device can be kept in a room and it will detect the amount of CO in the values of PPM(particles per million).If the values go above 250 PPM the buzzer turns on and gives a warning. This indicates that it is time to let fresh air in your room.A tutorial of this simple yet effective device is available in the next slide.

### Budget

Arduino uno- 750 Indian Rupees

MQ7 CO sensor - 115 Indian Rupees

a buzzer - 12 Indian Rupees

A couple of wires - 10 Indian Rupees



## 12 Oil spills

Communities of oil-eating bacteria are naturally present throughout the world's oceans, in places as different as the warm waters of the Persian Gulf and the Arctic conditions of the Chukchi Sea north of Alaska. Each community of bacteria is specially adapted for the environment where it is living, and studies have found that bacteria consume oil most quickly when they are kept in

conditions similar to their natural environments. So that means that if you took Arctic bacteria and brought them to an oil spill in the Gulf of Mexico, they would not eat the oil as quickly as the bacteria that are already living in the Gulf. There are at least seven species of ocean bacteria that can survive by eating oil and nothing else. However, usually only a small number of oil-eating bacteria live in any given part of the ocean, and it takes a few days for their population to increase to take advantage of their abundant new food source during an oil spill.

There are species of marine bacteria in several families, including *Marinobacter*, *Oceanospirillales*, *Pseudomonas*, and *Alcanivorax*, that can eat compounds from petroleum as part of their diet. These bacteria are known as hydrocarbon degrading bacteria. *Pseudomonas* can digest the hydrocarbons in oil. They are gram negative bacteria that are found in soil, water and plants and animals. A species called *Pseudomonas putida* is widely used in oil spill decontamination or bioremediation.

Plant-associated *Pseudomonas* live as saprophytes and parasites on plant surfaces and inside plant tissues. Many plant-associated *Pseudomonas* promote plant growth by suppressing pathogenic microorganisms, synthesising growth-stimulating plant hormones and promoting increased plant disease resistance. *Pseudomonas* species can act both as PGR and in phytopathogen control due to their ability to secrete specific compounds having essential roles in phosphate solubilizing compound production, siderophore production, and nitrogen fixation as a part of its plant growth-promoting activities. *Pseudomonas* spp. primarily inhibit bacterial pathogens by nutrient limitation and iron sequestration in food stored under aerobic conditions.

This has been demonstrated in several studies involving microbiological media, meat, poultry, milk, fish, and fresh vegetables.





## 10. Refrigerator device to reduce chlorofluorocarbons

take a small metal box or aluminium foil ( Shaped into a box ). Put holes only on the sides and on the top of the box

Take a small amount of Charcoal in any form, granular, powder

To make it activated charcoal, we can add lime into it.

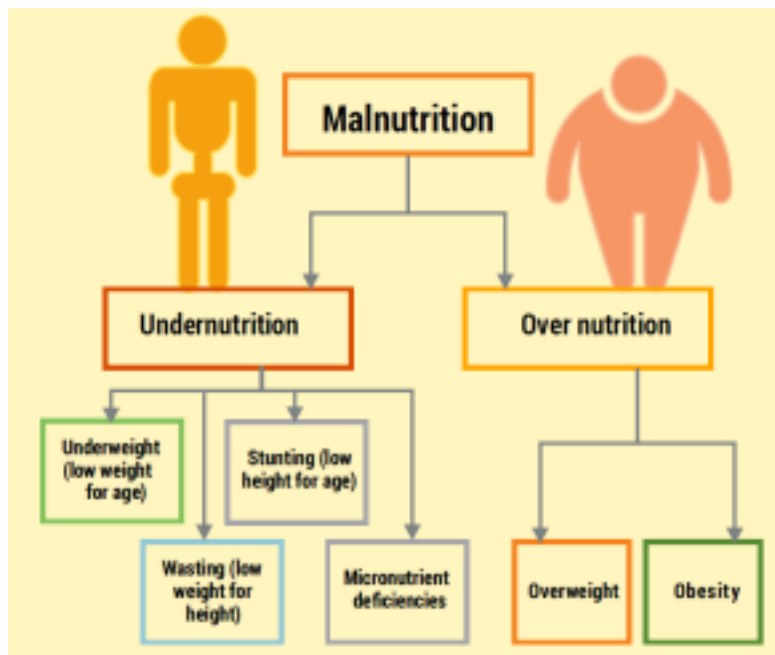
To make the activated charcoal more efficient, add coconut fibre burnt, as a powder. Lastly, put the mixture into the metal/aluminium box and place it in the corner of your refrigerator. This is a small, simple device which has a great impact upon human's lives. This device works on the principle of absorption property. This involves a chemical reaction between the substance and the absorbing material. The Charcoal absorbs only the carbons which shouldn't affect food. So the gases do their job of cooling the space while the charcoal extracts the carbon out of it.

## 13) HOMEMADE NUTRITION POWDER to ENHANCE GROWTH AND BUILD IMMUNITY

Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. The term malnutrition covers 2 broad groups of conditions. One is

'undernutrition'—which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals). The other is overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes, and cancer). Malnutrition occurs when the body doesn't get enough nutrients. Causes include a poor diet, digestive conditions or another disease.

Symptoms are fatigue, dizziness and weight loss. Untreated malnutrition can cause physical or mental disability.



The effects of malnutrition are:

- Weight loss
- Loss of fat and muscle mass
- Hollow cheeks and sunken eyes
- A swollen stomach
- Dry hair and skin
- Delayed wound healing
- Fatigue
- Difficulty concentrating
- Irritability
- Depression and anxiety

People with undernutrition may have one or several of these symptoms. Some types of undernutrition have signature effects.

In biology, immunity is the state of being insusceptible or resistant to a noxious agent or process, especially a pathogen or infectious disease. Immunity may occur naturally or be produced by prior exposure or immunisation. The immune system has innate and adaptive components. Innate immunity is present in all metazoans, immune responses: inflammatory

responses and phagocytosis. The adaptive component, on the other hand, involves more advanced lymphatic cells that can distinguish between specific "non-self" substances in the presence of "self". The reaction to foreign substances is etymologically described as inflammation while the non-reaction to self substances is described as immunity. Immunodeficiency, also known as immunocompromisation, is a state in which the immune system's ability to fight infectious diseases and cancer is compromised or entirely absent. Most cases are acquired ("secondary") due to extrinsic factors that affect the patient's immune system. A person with a weakened immune system is likely to get infections more frequently than most other people, and these illnesses might be more severe or harder to treat. These individuals may also find themselves dealing with an infection that a person with a stronger immune system would not get.

Signs and symptoms of primary immunodeficiency can include:

- Frequent and recurrent pneumonia, bronchitis, sinus infections, ear infections, meningitis or skin infections
- Inflammation and infection of internal organs
- Blood disorders, such as low platelet count or anaemia
- Digestive problems, such as cramping, loss of appetite, nausea and diarrhoea • Delayed growth and development
- Autoimmune disorders, such as lupus, rheumatoid arthritis or type 1 diabetes

Protein builds the foundation of the body. It is very crucial for the growing children as proteins build and repair the cells, muscles, enzymes, hormones and it also provides energy to kids. Proteins are easily available in nuts, fish, eggs, chicken, dairy products and the list is endless. The problem arises because kids are picky eaters and most often than not they refuse to eat healthy food. In this situation, protein powder is the best option as you can provide the required protein to your kid in an easy and tasty way. It is a very popular nutritional supplement and it also helps in ensuring that your kids are getting enough protein.

Homemade protein powder is healthy and safe

Buying protein powder can be a bit problematic as you might not know what all is present inside it. It is also loaded with artificial preservatives. So, to solve this problem, we will tell you how to prepare protein powder at home with pure and healthy ingredients. Homemade protein is also cheaper and its quality will no doubt be better than what is available in the market. And the best thing is, it can be made with easily available ingredients at home.

First method:

For this method you will need dry nonfat milk powder (3 cups), dry oats either old fashioned one or instant dry oats(1 cup) and almonds(1 cup) and jaggery/sugar or sweetener, if you prefer. You

can also add 1/4 cup cocoa powder. Blend everything in the mixer and store it in a clean jar. Store it in the fridge if you want to keep it for a long period. This homemade protein powder should be

used everyday to attain its benefits. The 1/2 cup-scoop has 180 calories and 12 grams of protein in it. You can add it in smoothie/shakes or milk.

#### Second method

In this method you will require 1/4 cup each of- Almonds, Pistachios, Walnuts, Peanuts, Soya Beans, Pumpkin seeds, Flaxseeds, Chia Seeds, Oats and Milk Powder. Now, dry roast all the nuts together in a pan for about 2-3 minutes on low flame. In a similar manner dry roast all the seeds and oats and wait for them to cool down. In a blender blend all the roasted ingredients with the milk powder. You will get a powdered consistency, sieve it and then put it in a jar and store. You can mix 1/4 cup cocoa powder. You can add it to milk, shakes, smoothies and even halwas and porridge. One scoop of this powder contains 10.5grams of protein and 45 calories per scoop. If you are vegan you can just substitute milk with the coco powder.

#### Third method:

For this method take 1/2 cup of Almonds, Cashews and Pistachios and 1/2 tsp each of nutmeg powder, saffron strands and turmeric. Roast Almonds, Cashews and Pistachios in a pan and wait for them to cool down. In a similar manner roast the saffron strands and wait for it to change the colour. Blend all ingredients in a blender and add turmeric and nutmeg powder to the mixture. Blend it one more time in order to evenly mix everything. The powder might be a little bit sticky and you can use it in making rotis, ladoos and milk.

#### Fourth method:

For this method take 100 grams of oats, peanuts, almonds, soya dal/soya flour and 50 grams of milk powder. Now dry roast all the ingredients one after another and place them in separate bowls and let them cool down. Before blending, mince the ingredients to make the blending easier. In a blender blend all the roasted ingredients with the milk powder. You will get a powdered consistency, sieve it and then put it in a jar and store. Add 1 tbsp of this into juices, smoothies, milk, and shakes.

#### Budget

- 250 g of pumpkin seeds --- Rs.132
- 250 g of Jaggery / sugar --- Rs.88
- 250 g of Ragi--- Rs.30
- 250 g of Dry oats --- Rs. 40
- 250 g of almonds --- Rs. 130
- 250 g of Flaxseeds --- Rs.80
- 250 g of chia seeds --- Rs.90
- 250 g of sesame seeds --- Rs.100

## 14 Cure for viral diseases like dengue and malaria

These days there has been a deadly amount of increase in the number of cases of dengue and malaria. You might have various headlines about the same on the news television. These viral diseases are caused by certain mosquitoes. The victims of these diseases suffer severe health issues and these may even cause death.

Annually it is observed that about 241 million people are affected by these diseases. With the increasing rate of cases a lot of people may undergo serious health conditions. The plants that will help cure the disease

Scientific names

Common names

Part can be used

Basilicum polystachyon Musk basil Whole plant Cymbopogon citratus Lemongrass The main Part Ocimum tenuiflorum Tulsi/ basil Whole aerial body Psidium guajava Guava Bark Allium Sativum Garlic The compounds Carica papaya papaya Whole aerial body Euphorbia hirta Euphorbiaceae “ “ Tinospora cordifolia giloy “ “ Azadirachta indica Neem “ “

Swertia Chirayata “ “

This can be crushed and can be consumed in any form so that it enters our body. It can be used by people who are already suffering with the disease or everyone in general as it helps boost our immunity and prepares our body to be prepared when any other disease is attacked.

A clove of onion and turmeric and a dash of jaggery powder- added

Secondary measure

Also as a secondary preventive measure we will grow many such plants which prevent the entry of mosquitoes and are easily available to us.

1. Citronella Geranium
2. Lemon Balm
3. Floss Flower
4. Citronella
5. Lavender
6. Peppermint
7. Marigolds
8. Basil



9. Mint

10. Sage

The plants are known for their medicinal properties. They are very nutritious and contain all the necessary nutrients. Their scent and essential oil helps keep these mosquitoes away.

## **15 SUSTAINABLE SANITARY PADS**

Various companies across the world produce sanitary pads on a large scale that can be a huge part of environmental pollution and also cause various diseases like cervical cancer due to the presence of chemicals.

They make an enormous contribution to the landfill, with a remarkable 45 billion ending up in landfill each year. In addition, many disposable pads and tampons end up in the sea, contributing to the destruction of marine life and water pollution.

In order to overcome this we have come up with the solution of making the pads with the help Of recycled materials and also make use of natural plants to make it act like a disinfectant but also be equally eco friendly.

Materials required

1. Recycled polyester from clothes
2. Bamboo and hemp fleece
3. Cotton jersey

Global Fashion Industry Waste

Up to 100 billion garments are produced by the fashion industry every year. And each year, as much as 92 million tons of clothing ends up in landfills.

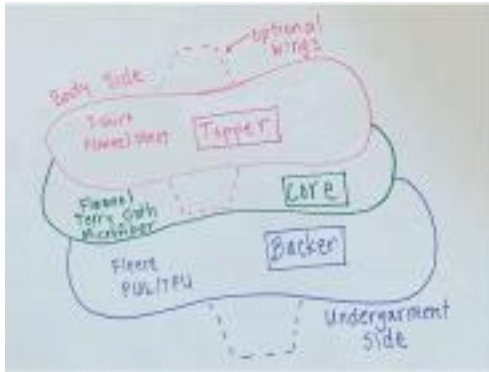
And we can use the waste generated from these as the “recycled polyester from clothes”. The fibres of “bamboo and hemp fleece” are a perfect example of highly absorbent material yet eco-friendly.

The fibres of “cotton jersey” are the ones which are very common yet eco friendly and absorbent.

The fibres of “bamboo and hemp fleece” are a perfect example of highly absorbent material yet eco-friendly.

The fibres of “cotton jersey” are the ones which are very common yet eco friendly and absorbent.

This can be reusable or can be thrown away and is completely your choice. It won't harm the environment



Addition of a disinfectant to the pads to prevent the diseases

This is a replacement for the chemicals that are used in the ordinary pads. It will be made up of neem extract, lemon grass, and lavender for fragrance. All these substances contain properties to overcome infections and are highly effective.

## 16) CENTRIFUGAL FORCE TOY



## 17) AUTO IRRIGATION SYSTEM

