

## PROJECT WORK

**SUBJECT** : BIOLOGY

**CLASS** : X EM

**NAME OF THE LESSON** : NATURAL RESOURCES

**NAME OF THE PROJECT:** 4 R PRINCIPLE

**STRATEGY** : GROUP

**GROUP LEADER** :

**GROUP MEMBERS** : DIVISION OF THE WORK

SN	GROUP MEMBERS	DIVISION OF WORK

**GUIDE TEACHER:** K. Manjula, SA(BIO)

**TIME ALLOTTED** : 4 TO 5 DAYS.



**AIM OF THE PROJECT:** Adoption of 4 R principles as a part of solid waste management.

**OBJECTIVES OF THE PROJECT:**

1. To make a list of house hold waste material in a day.
2. To calculate the waste in kgs and discussing about its magnification and adverse effects on the environment.
3. To collect the information about waste management from teacher with the help of questioner prepared.
4. To collect information regarding 4 R principles like Reduce, Reuse, Recycle and Recover from the internet.
5. Analyzing the hierarchy of 4Rs and the benefits of waste management.
6. Concluding with the follow up activities in this regard.

**TOOLS:**

1. Table showing the household waste materials.
2. Questioner to the teacher to collect information about waste management.
3. Pictures to represent the hierarchy of 4R principle.

**PROCEDURE:**



**WASTE.....WASTE.....WASTE.....**

Today the Earth is surrounded by waste material like garbage of house hold activities. Waste is anything to discard and its felt it is not required. Disposing of waste material can have a significant impact on environment. Producing excessive amounts of waste is sign that over work may be inefficient, On this regard we would like to undertake the project on solid waste management to explore the framework of waste management.

As the first step we collected the solid waste material which is generated and intended to throw throughout the day in a house. It is weighed and considered as average waste produced on that day. Now we calculated the average waste material that is intended to throw.

SN	ITEM TREATED AS WASTE	WEIGHT IN GMS
1	Vegetable peels	200 gms
2	Plastic waste	200 gms
3	Cloths/ paper as waste	300 gms
4	Any paper rolles/ cones etc	200gms
5	others	100 gms

### Calculation:

The solid waste produced per day by a family = 1 kg

The solid waste produced per month by a family = 30 kgs

The number of families in our colony = 50

The solid waste produced by the colony per month = 1500 kgs

We are just astonished to find such a huge figure that is going to create a hazardous adverse effect on the environmental frame work. In this regard we strongly determined to come out with the better waste management techniques. As the first step we interviewed our teacher to collect the information about adverse effects of waste on the environment and waste management techniques.



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## QUESTIONERE

### 1. What is the impact of waste on the environment?

- a. When the waste gets accumulated in the environment, it creates an imbalance in the ecosystem of the earth. It may also enter into the food chain of the ecosystem that leads to bio accumulation and bio magnification.

### 2. How can we prevent the generation of waste?

- a. By adopting the 4 R principle we can save our earth from the evil of waste.

### 3. What are the benefits of waste management techniques?

- a. Waste management not only prevents the accumulation of waste but also may generate lot of advantages like energy production, recreation, better scope for creativity and also may encourage the economic profit.

### 4. Does waste management cost anything?

- a. Yes. Of course. It may cost for collection of waste, transportation etc. So its better not to generate waste.

### 5. What is the role of organizations and Governments in this regard?

- a. Each and every citizen has to take responsibility to avoid waste generation. Even the Government also undertakes the projects to keep the country clean and green.

THANK YOU

We have also collected a lot of information in this regard from the internet and aggregated all the information together as follows.

### INTRODUCTION:

Solid waste is nothing but any garbage that we make in our home or other places. This may include car tires, plastic bottles, plastic cups, old news papers, broken furniture and even food waste such as fruits and vegetable peels, etc. But we feel that there is a need for a complete rethinking of waste to analyze if waste is indeed waste. A rethinking that calls for

- WASTE TO BECOME WALTH
- REFUSE TO BECOME RESOURCE
- TRASH TO BECOME CASH



## THE ADVERSE EFFECT OF WASTE ON THE ENVIRONMENT:

Accumulation of waste is due to its improper disposal is a major problem in our country. Population in India has been growing at a rapid rate. With this increase there has been increase in the amount of waste being produced especially in the cities. Every person on an average generates about 400 to 500 grams of waste per day. At this rate in the city of ten lakh people around 500 tones of waste is being produced every day. In the absence of proper proper waste management, this waste lies littered on our streets, road corners and improperly disposed of in vacant land.



## IMPLICATIONS:

1. Disposal of waste lead to serious health hazards.
2. They invite host of problems like increasing numbers insect vectors like mosquitoes, flies, etc.
3. They also invite the scavengers such as street dogs, pigs and rats which spread dangerous diseases.
4. It also generates bud odor and causes pollution.

In order to avoid these adverse effects we have to switch on to the waste management practices i.e. **4R PRINCIPLE**.



**REDUCE**



**REUSE**



**RECYCLE**



**RECOVER**

## THE 4 Rs

### REDUCE:

A key part of waste reduction is conservation of natural resources wisely. It is the preferred approach to waste management. Because if the waste is not generated, there is no issue of waste management at all.



#### Ex:

- Shop smartly and try not to buy products that have too much packing.
- Purchase bags for life and use these each time you go shopping.
- Avoid disposable or single use items such as napkins, razors, plastic cutlery, cameras and batteries etc.

Thus waste reduction helps to conserve resources for future generation and contributes to a cleaner environment.

**REUSE:** Using an object again either for its original purpose or for a similar purpose. By reusing materials and items, they have longer life spans and are not thrown away after the first use. So before throwing the items once used, it is said to think about how it can be used again.



#### Ex:

- Buy rechargeable batteries.
- Take unwanted furniture and sloths to reuse scheme.
- Make use of plastic bottles, tissue paper rolls as many useful things by adding creativity.



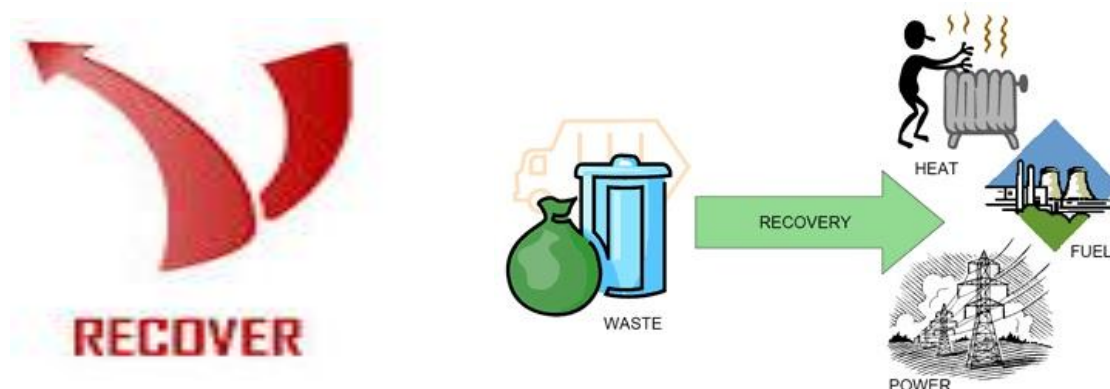
**RECYCLE:** Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products. Recycling can benefit our community and the environment.



#### Benefits of Recycling:

- Reduces the amount of waste sent to landfills and combustion facilities.
- Conserves natural resources such as timber, water and minerals.
- Prevents pollution by reducing the need to collect new raw materials.
- Saves energy.
- Reduces emission of green house gases that lead to global warming.
- Helps to sustain the environment for future generation.

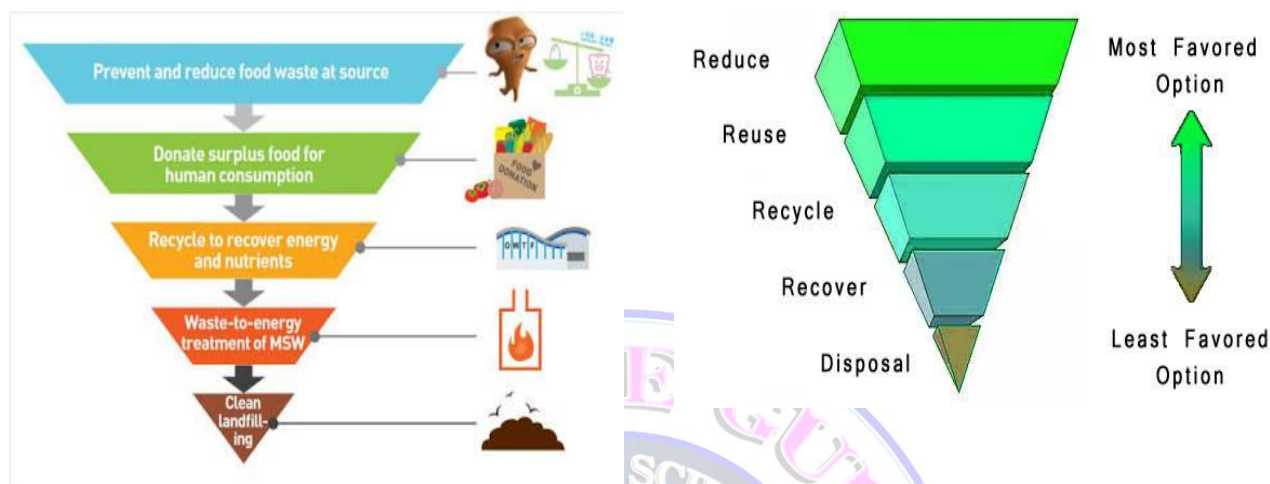
**RECOVER:** If there is still waste left after we have reduced, reused and recycled as much as we can, we can use it to make energy. This is the last option by which we can gain energy from waste.



## ANALYSIS:

From the above study we can make out that there is nothing waste on this earth. So throwing anything as waste is our inefficiency to make use of it. The 4 Rs provide an ecologically sound and environmentally friendly approach to minimizing and managing waste.

## WE CAN FORM THE HIERARCHY OF 4 RS.



- Where ever possible waste reduction is preferable option.
- If waste is produced every effort should be made to reuse it.
- If we intend to throw it after several reuse, it can be recycled.
- Finally it may be possible to recover materials or energy from waste which cannot be reduced, reused and recycled.

## CONCLUSION:

Accumulation of waste in the environment lead to several hazardous thins. So each and every individual should take an oath to adopt the 4Rs.

## THE BENEFITS OF 4RS:

- It lowers the waste disposal cost.
- It lowers the waste treatment cost.
- It lowers the energy cost.
- It saves the money on materials and supply.
- It also lowers storage cost.
- There is recovery of cost through the scale of recyclable materials.

So it is concluded that there are several ways of making use of waste. By adopting the most advantageous and preferable 4R principle, we can sustain our environment clean and also sustain the natural resources for the future generation.



### WASTE THINGS WE REUSED:



**OUR EXPERIENCES:** When we learnt about the quantity of waste produced in our colony, we could start rethinking about the damage we caused to our environment all these years. But when we could make use of waste to meet our interest, our necessities, we could relieve ourselves from the guilty feeling of our foolishness. We could come out with the creativity to generate the useful things from the waste.

### CREATIVE RESPONSE:

1. Are there any organizations to support the recycling or recover of the waste?
2. What kind of strategy we need to think to adopt the 4R principle in our school and our colony?

**ACKNOWLEDGEMENT:** We thank our guide teacher Smt. K. Manjula, to guide us in proper direction. We also thank our parents, friends and internet person to cooperate with us to bring about the desired outcome.

**RESOURCES USED:** Teacher and internet.