

E & F BLOCK MESSES (LADIES HOSTEL)

PROJECT REPORT

Submitted for the course: Solid Waste Management (CLE2020)

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(SCHOOL OF CIVIL ENGINEERING)



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

November, 2018

CERTIFICATE

This is to certify that the project entitled “E & F BLOCK MESSES” that is being submitted by Ila Hari, Aashika Jain, Shivangi Singhal, Jaishree, Angela Merlin , Pragya Shukla, Isha Soni for SOLID WASTE MANAGEMENT (CLE2020) is a record of bonafide work done under the supervision of Dr. Bhaskar Das. The contents of the project work, in full or in parts, have neither been taken from any other source nor have been submitted for any other CAL course.

Place: Vellore

Date: 13\11\2018

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ACKNOWLEDGEMENTS

We would like to thank VIT and the dean of SCE –S. K. Sekar Dean, School of Civil Engineering VIT University, for giving us an opportunity to carry out our studies at the University and successfully compiling our project. We would also like to acknowledge Prof. Sasanka Bhushan for extending his constant support and help in the completion of this project.

We would also like to extend our gratitude towards the mess people the cleaning staff of ladies hostel for their help and support during collection of information and the students who filled the Google forms. Without their co-operation and help the compilation of this project would not have been possible.

ABSTRACT

This document comprises of the survey data through Google forms and the information collected by asking the mess staff and cleaning staff members. The analysis of this data has been done and per capita waste generation is calculated.

STUDY AREA

This study was conducted in the E (IDA SCUDDER) & F (SUU KYI) block of Ladies Hostel in VIT University.



OBJECTIVE

- i. To identify the total amount of solid waste generated (kg/week) in E, F and E-annex blocks and special, veg and non-veg messes in ladies hostel.
- ii. To segregate the solid waste in each blocks and messes specially non- biodegradable and wet fraction.
- iii. To identify the present practice of solid waste management in hostels and messes.
- iv. To evaluate the present solid waste practice and recommendations for improvement.

METHODOLOGY

- i. Selection of blocks and messes
- ii. Collection of data (give details like no. of rooms, dustbins, no. of non ac and ac rooms)
- iii. Segregation of waste-weight analysis of different waste
- iv. Conducting a survey of students (questionnaires) from their respective blocks and messes as well as of the workers in the different messes.
- v. Drawing a conclusion based on the survey
- vi. Suggesting effective methods to improve the present scenario based on various case studies

INTRODUCTION

Hostel Blocks Information:

i. F Block

10 floors (Average of 32 rooms on each)

- No. of single bedded rooms – 6
- No. of four bedded rooms – 110
- No. of six bedded rooms - 210

Each floor has 6 dustbins – 4 in the corridors and 2 in the bathroom.

ii. E Annex

3 floors (Average of 35 rooms on each)

- No. of four bedded rooms – 57
- No. of six bedded rooms - 48

Each floor had 8 dustbins-6 in the corridors and 2 in the bathroom.

iii. E Block

10 floors (Average of 40 rooms on each floor (from floor 4-8) and average of 18 rooms on each floor (from ground floor to 3rd floor)

- No. of single bedded rooms – 4
- No. of two bedded rooms – 210
- No. of four bedded rooms – 68

Each floor has 6 dustbins-4 in the corridors and 2 in the bathroom.

Total number of students in hostel blocks E & F combined are – 2697

- In F block = 1548
- In E block = 633
- In E annex = 516

TYPES OF WASTES GENERATED IN ROOMS:

In full capacity the weight of the dustbins on the floor varies from a minimum of 2 kgs to 7kgs. It varies due to the following reasons –

- Day of the week
- Time of the day
- Month
- Exam timing (paper waste is more during cat – 2)
- Long holidays

Type of waste in floor dustbin includes –

- Cardboard boxes (pizza boxes, packaging boxes, juice boxes)
- Wrappers
- Paper waste
- Food waste (fruit peels)
- Personal waste (hair, sanitary napkins, cotton swabs)
- Plastic (bottles)

All dustbins are emptied daily and then the different wastes are separated and transported.

On any day of the week the dustbins are emptied twice a day. The cleaning ladies collect all 4 dustbins on each floor after rooms are cleaned and taken down in to a common area. The collection vehicle then transports all the waste to a dumping ground

Data Collected:

Q: What happens to the waste collected from the floor dustbins?

A: It is collected and transferred to a truck downstairs and transported to a common dumping site.

Q: Do you separate the waste? If yes then how?

A: the waste is not exactly segregated specifically but if they come across some toxic waste the cleaning they dispose it with the bathroom.

Q: Where and how do you dump the bathroom waste?

A: Bathroom waste is dealt with separately. It is collected and temporarily transferred to a common dumping area behind the hostel block. A collecting truck comes once a day and transports the waste to a place where it is incinerated.

Q: How many times a day are the bathroom dustbins emptied?

A: on a regular basis the dustbins are emptied twice a day but if they see that the dustbins have reached full capacity they empty it and take the waste to the common collecting area. At the most these dustbins are emptied four times.

Mess Information:

There are 4 types of mess:

- a. Veg
- b. Non-veg
- c. Special
- d. Food Park

In messes three types of waste is generated-

- Paper waste such as tissue paper or paper cups and paper glasses
- Plastic waste such as straws, wrappers
- Food waste – from the kids eating in the mess and kitchen waste such as peels and other inedible waste from vegetables and fruits.

Data Collected:

SPECIAL MESS

QUESTION	ANSWER
No. of people registered in the mess?	850
Food wasted by kids (approx.)	100 kg/day
Waste generated in the kitchen (approx.) (organic waste like peels and inedible parts of vegetables and fruits)	30kg/day
Segregation of waste	Done on the spot, paper waste is separated from the organic food waste and is put in separate bins
What happens to the waste after collection?	A vehicle from the collecting agency comes to pick up the waste and the organic waste is used as fodder/ food for pigs. Waste is usually collected twice a day
No. of people working in this mess (approx.)	55

VEG MESS

QUESTION	ANSWER
No. of people registered in the mess?	450
Food wasted by kids (approx.)	70 kg/day
Waste generated in the kitchen (approx.) (organic waste like peels and inedible parts of vegetables and fruits)	20kg/day
Segregation of waste	Done on the spot, paper waste is separated from the organic food waste and is put in separate bins
What happens to the waste after collection?	A vehicle from the collecting agency comes to pick up the waste and the organic waste is used as fodder/ food for pigs. Waste is usually collected twice a day
No. of people working in this mess (approx.)	30

NON-VEG MESS

QUESTION	ANSWER
No. of people registered in the mess?	600
Food wasted by kids (approx.)	100 kg/day
Waste generated in the kitchen (approx.) (organic waste like peels and inedible parts of vegetables and fruits)	20kg/day
Segregation of waste	Done on the spot, paper waste is separated from the organic food waste and is put in separate bins
What happens to the waste after collection?	A vehicle from the collecting agency comes to pick up the waste and the organic waste is used as fodder/ food for pigs. Waste is usually collected twice a day
No. of people working in this mess (approx.)	30

Also there are shops present inside the hostel complex which also generate waste



Waste from shops mainly consists of wrappers, disposal bowls, paper cups, disposal plates etc.



Currently due to the construction and rehabilitation activities going on inside the hostel there is also construction waste present.

CALCULATION :

Total amount of waste generated per person

1. On weekdays –

Total waste – 540 Kgs

In rooms – 50 grams of plastic (wraps,bottles, etc)

In mess – 100-200 grams (depends on food quality)

Therefore per person – 200 grams

There per capita waste generated is 200grams/person/day

GRAPHICAL ANALYSIS OF THE SURVEY DATA COLLECTED:

QUESTIONNAIRE: (HOSTEL)

WASTE MANAGEMENT

A survey to help move a step closer to a cleaner campus. (LADIES HOSTEL)

***Required**

Email address *

Your email address

Name

Your answer

BLOCK

☐ E - BLOCK

☐ F BLOCK

NEXT

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WASTE MANAGEMENT

HOSTEL

Hostel floor?

☐ GROUND

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

☐ 9

☐ 10

How many beds are there in your room?

☐ 1

☐ 2

☐ 4

☐ 6

Is there any AC in your room?

☐ Yes

☐ No

Are there enough dustbin on your floor?

☐ Yes

☐ No

Are there enough dustbin on your floor?

- ☐ Yes
☐ No
☐ Can't say

How frequently are the dustbins emptied?

- ☐ Everyday
☐ Alternative days
☐ Once a week
☐ Any other

Do you have a dustbin in your room?

- ☐ Yes
☐ No

How often is your room's dustbin emptied?

- ☐ Everyday
☐ Alternative days
☐ Once a week
☐ Other: _____

Which type of waste do you generate the most?

- ☐ Plastic
☐ paper
☐ cardboard
☐ Other: _____

How many pens do you need per month?

- ☐ 1-2
☐ 2-5
☐ >5

How many packets of snacks do you consume per week?

- ☐ Less than 5
☐ 5-10
☐ 10-20
☐ >20

How many plastic bottles do you use per week?

- ☐ Don't use
☐ 0-2
☐ 2-5
☐ 5-10
☐ >10

Number of plastic bags you use per week?

- ☐ 0-5
☐ 5-10
☐ >10

Number of cardboard boxes (pizza,packing etc.) you use per week?

- ☐ 0-5
☐ 5-10
☐ >10

Number of cardboard boxes (pizza,packing etc.) you use per week?

- ☐ 0-5
☐ 5-10
☐ >10

How many pages did you dispose per week after CAT II on average?

- ☐ 0-100
☐ 100-200
☐ >200

Do you notice the presence of anything below from the dustbin?

- ☐ Dark flowing water
☐ odour
☐ mosquito and cockroaches
☐ rats
☐ It's pretty clean

How do you dispose the waste generated in your room?

- ☐ Room dustbin
☐ Floor dustbin
☐ Window

BACK

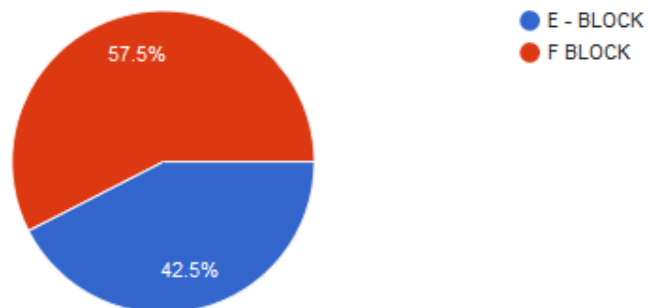
NEXT

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GRAPHS OBTAINED FROM THE RESPONSES: (HOSTEL)

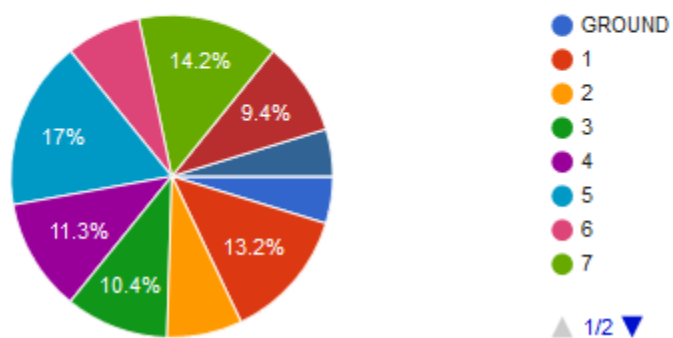
BLOCK

106 responses



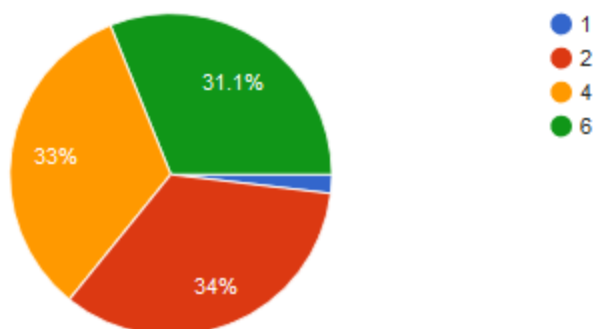
Hostel floor?

106 responses



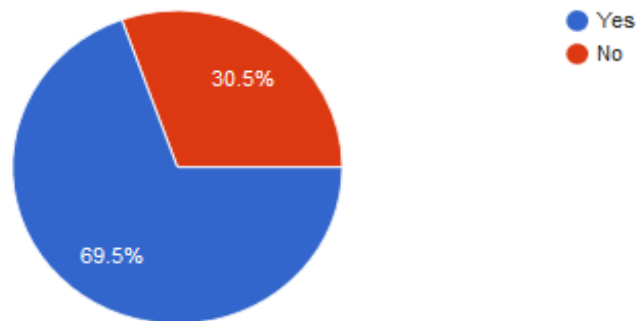
How many beds are there in your room?

106 responses



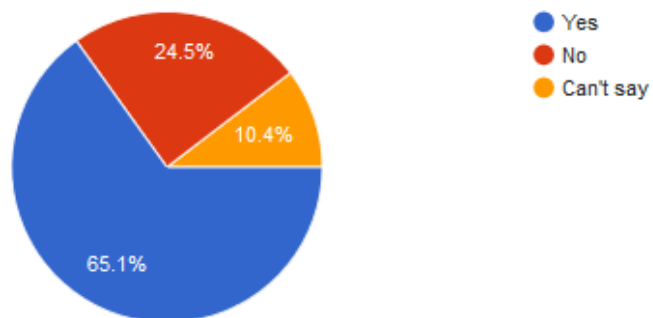
Is there any AC in your room?

105 responses



Are there enough dustbin on your floor?

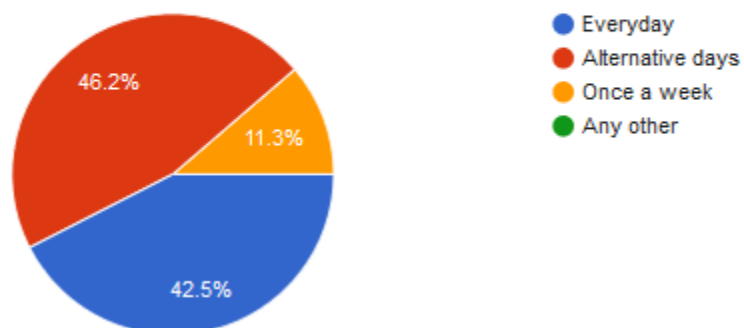
106 responses



ACCORDING TO MAJORITY OF THE STUDENTS IN THE HOSTEL THERE ARE ENOUGH DUSTBINS IN THE CORRIDORS.

How frequently are the dustbins emptied?

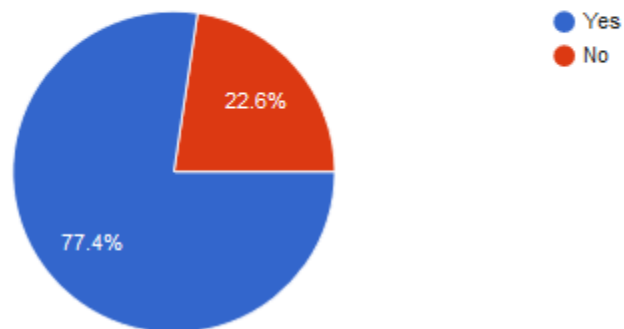
106 responses



ACCORDING TO THE STUDENTS THE DUSTBINS ARE EMPTIED EITHER DAILY OR ON ALTERNATE DAYS.

Do you have a dustbin in your room?

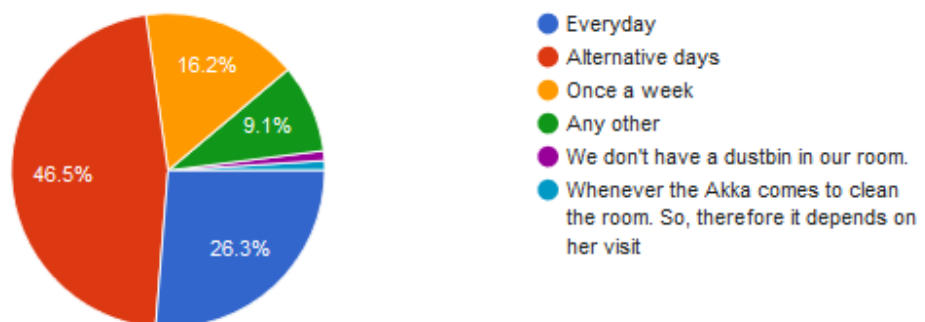
106 responses



MOST OF THE STUDENTS IN THE HOATEL HAVE DUSTBINS IN THEIR ROOMS.

How often is your room's dustbin emptied?

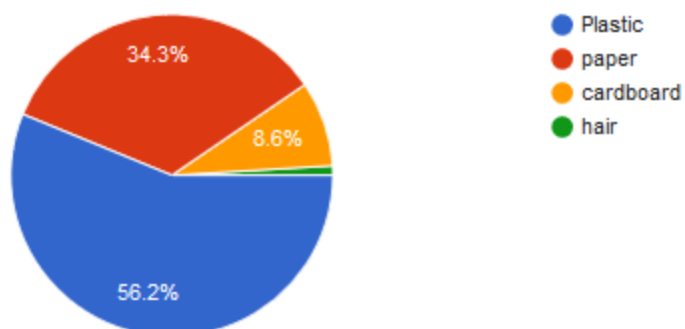
99 responses



IN THE HOSTEL MOST OF THE STUDENT'S ROOM DUSTBINS ARE EMPTIED ON ALTERNATE DAYS

Which type of waste do you generate the most?

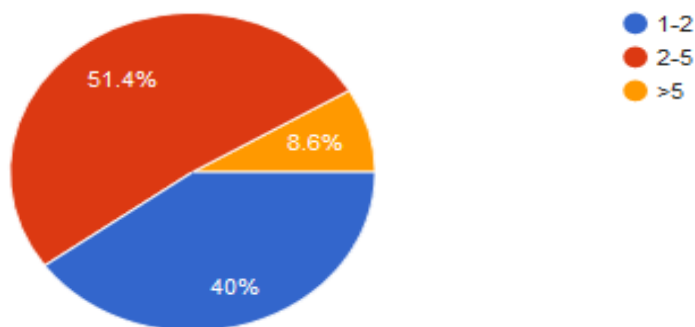
105 responses



MOST OF THE HOSTEL STUDNTS GENERATE PLASTIC WASTE.

How many pens do you need per month?

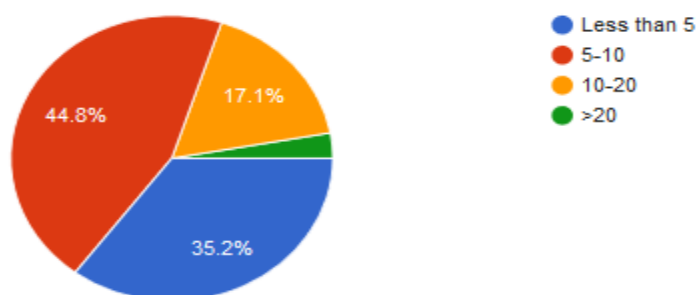
105 responses



MOST OF THE PEOPLE DISPOSE 2-5 PENS PER MONTH (PLASTIC WASTE)

How many packets of snacks do you consume per week?

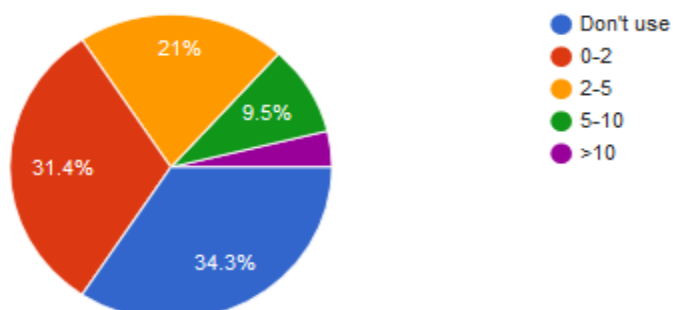
105 responses



MOST OF THE HOSTEL STUDENTS DISPOSE OFF 5-10 PACKETS (PLASTIC WASTE)

How many plastic bottles do you use per week?

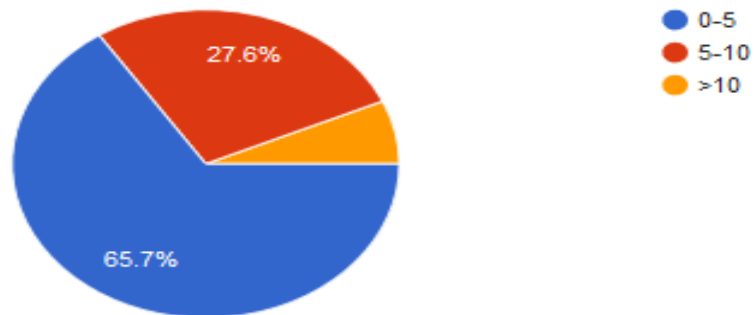
105 responses



MOST OF THE HOSTEL STUDENTS EITHER DON'T USE PLASTIC BOTLES OR USE A MAXIMUM OF 2 BOTLES

Number of plastic bags you use per week?

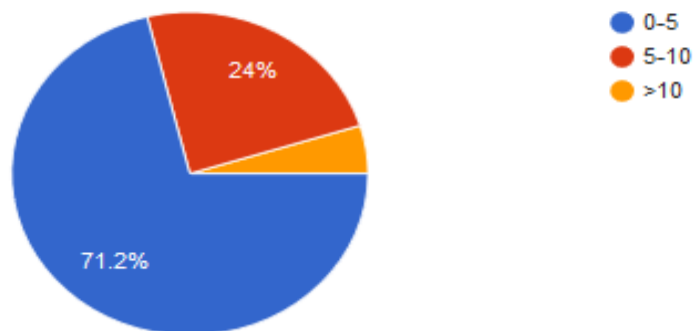
105 responses



MAXIMUM OF STUDENTS LIVING IN THE HOSTEL SE MAXIMUM OF 5 PLASTIC BAGS.

Number of cardboard boxes (pizza,packing etc.) you use per week?

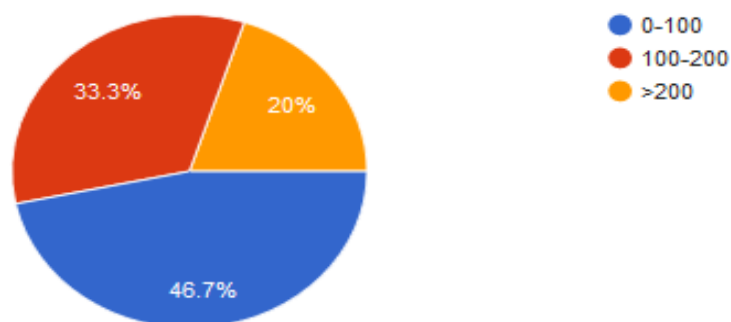
104 responses



MAXIMUM STUDENTS IN THE HOSTEL USE A MAXIMUM OF 5 CARDBOARD BOXES.

How many pages did you dispose per week after CAT II on average?

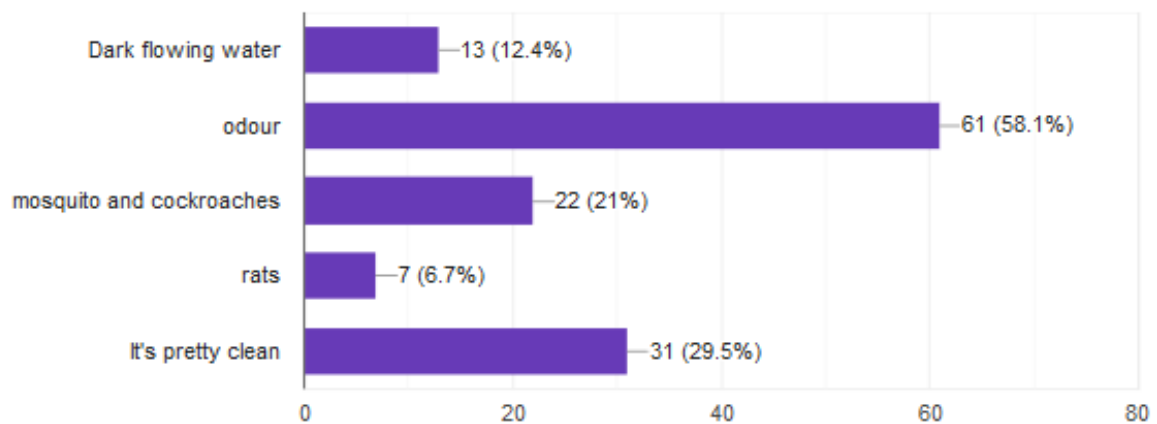
105 responses



MOST OF THE HOSTEL STUDENTS AFTER CAT 2 DISPOSED OFF 0-100 SHEETS

Do you notice the presence of anything below from the dustbin?

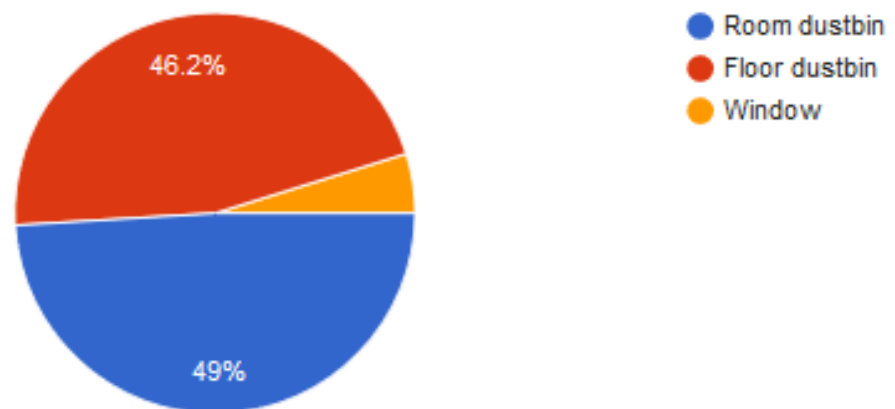
105 responses



MAXIMUM OF THE HOSTEL STUDETS AGREE THAT THERE IS ODOUR COMING FROM THE DUSTBINS

How do you dispose the waste generated in your room?

104 responses



QUESTIONNAIRE: (MESS)

WASTE MANAGEMENT

MESS

Are you

☐ Vegetarian

☐ Non Vegetarian

How many times a week do you skip breakfast at mess?

☐ Never

☐ 0-2

☐ 2-5

☐ >5

How many times a week do you skip lunch at mess?

☐ Never

☐ 0-2

☐ 2-5

☐ >5

What is the reason for skipping meals at mess?

☐ Bad food quality

☐ Mess timing

☐ Class schedule

☐ Other:

Which meal do you skip most?

☐ Breakfast

☐ Lunch

☐ Dinner

☐ Never

Where do you eat if you skip the meal in the mess?

☐ Don't eat

☐ Go out of the campus

☐ Inside canteen

☐ Parcel

How do you rate the waste management in the hostel on a scale of 1-10?

1 2 3 4 5 6 7 8 9 10

Very Poor ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Excellent

Which food is mostly wasted in the mess?

☐ Rice

☐ Sambhar

☐ Curry

☐ Other:

How can you reduce food waste in the mess?

☐ Buffet

☐ Better menu

☐ Better quality of cooking

☐ Awareness

☐ Other:

☐ Send me a copy of my responses.

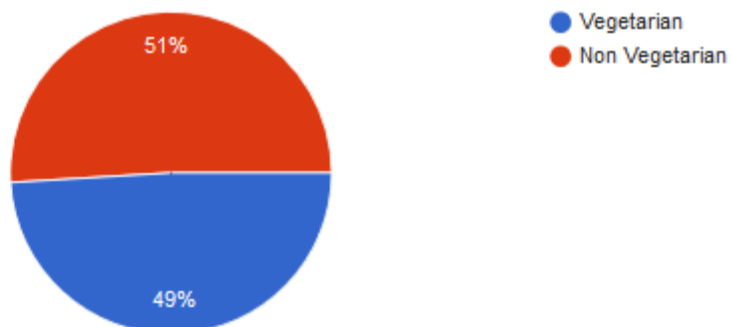
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GRAPHS OBTAINED FROM THE RESPONSES: (HOSTEL)

Are you

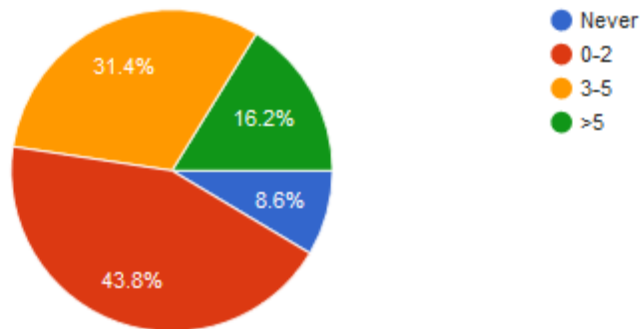
104 responses



THE NUMBER OF VEGETARIAN AND NON VEGETARIAN STUDENTS ARE ALMOST EQUAL

How many times a week do you skip breakfast at mess?

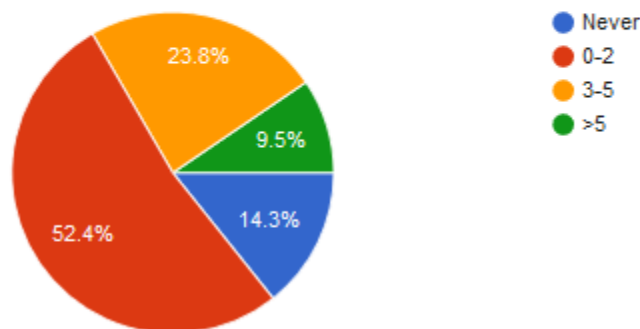
105 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY MISS BREAKFAST TWICE A WEEK.

How many times a week do you skip lunch at mess?

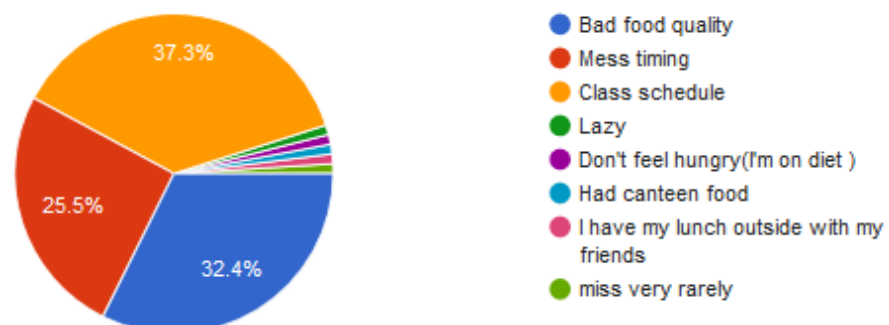
105 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY MISS LUNCH TWICE A WEEK.

What is the reason for skipping meals at mess?

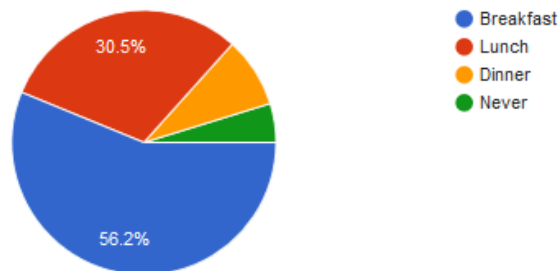
102 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY MISS BREAKFAST TWICE A WEEK.

Which meal do you skip most?

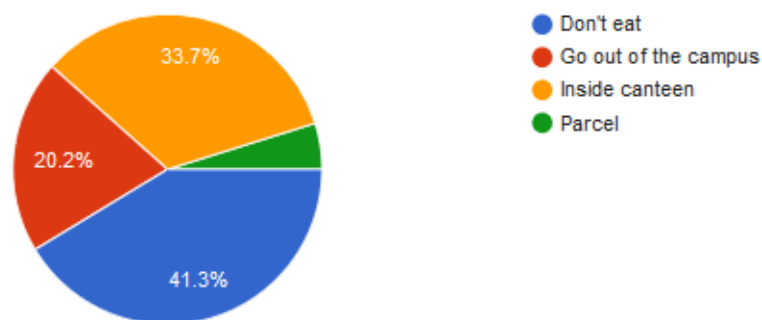
105 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY MISS BREAKFAST THE MOST.

Where do you eat if you skip the meal in the mess?

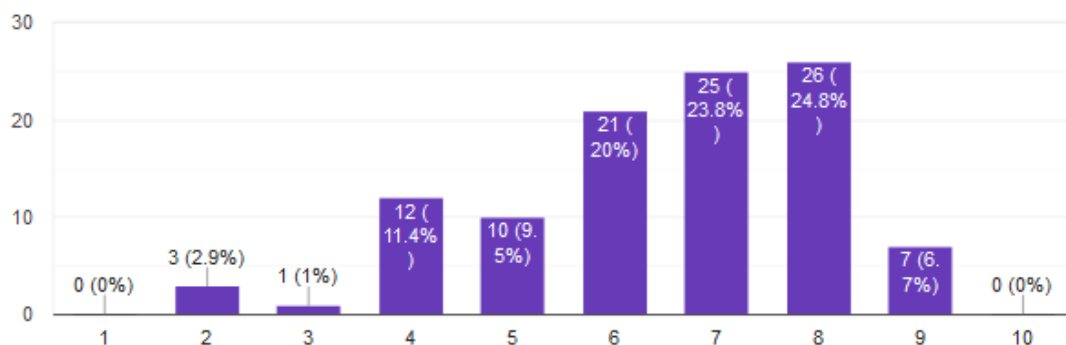
104 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY DON'T EAT AT ALL WHEN THEY SKIP OR MISS A MEAL IN THE MESS

How do you rate the waste management in the hostel on a scale of 1-10?

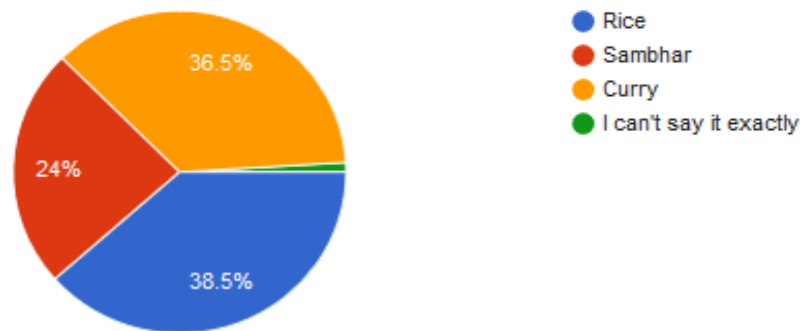
105 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY MISS BREAKFAST TWICE A WEEK.

Which food is mostly wasted in the mess?

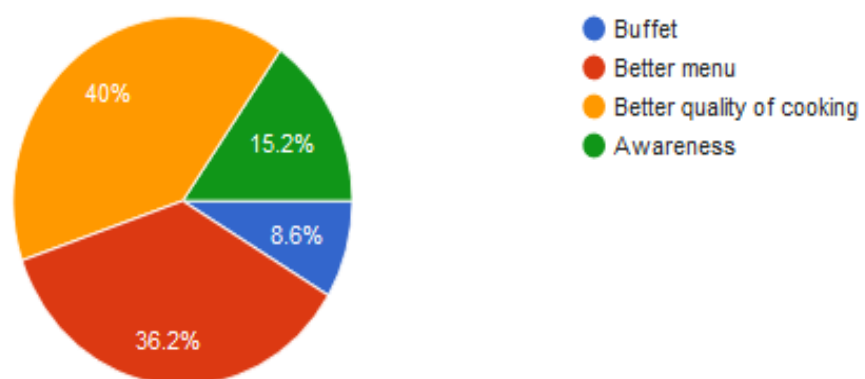
104 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILIT SAY THAT RICE AND CURY ARE THE MOST WASTED FOOD ITEMS IN THE MESS.

How can you reduce food waste in the mess?

105 responses



MAXIMUM OF THE STUDENTS USING THE MESS FACILITY SAY THAT FOD WASTE IN THE MESS CAN BE REDUCED IF THE QUALITY OF FOOD COOKED IN THE MESS IS IMPROVED.

SUGGESTIONS

- Waste generated can be substantially decreased if the students are made aware and are educated more about the harms of plastic and its excessive disposal.
- Promoting recycling and reusing is the best way to move forward.
- Banning plastic bags inside campus is one way to go, this will promote the usage of paper bags and bags made up of other recyclable and less harmful materials.
- Asking kids to dispose different types of waste in different bins so that the waste is separated in advance and easy disposal depending on the type of waste can be done.
- Wastage from the mess can be reduced by conducting a proper survey regarding student's preferences and then making a menu.
- Another way to decrease mess food wastage is by improving the quality of food provided in the mess and also improve on the variety of food provided in the mess.
- Causing awareness amongst students is the best way that can be taken to reduce way.



- Rutgers University, founded in 1766, is working to create an enduring future for students and the environment. As part of this commitment, Rutgers wanted to get more value from their existing resources and make their budget go farther. Since 2000, they've been doing just that, working with Waste Management to create campus-wide solutions that lower waste-related costs and improve efficiency.
- Although Rutgers is the eighth-oldest campus in the nation, they have a long history of thinking green. In 1972, the University was already a recycling pioneer. Today, with the help of Waste Management, the school recycles a remarkable range of materials — plastic, paper, cardboard, concrete, metal and C&D debris. They even send their organic waste to a local farmer for composting. And, with the largest solar field of any American campus, Rutgers also cogenerates much of the energy that powers the university.
- **With these past achievements, you can understand how Rutgers is well positioned to realize its sustainability goals. Since joining with Waste Management, the University has:**

- Achieved a 67% recycling material diversion rate, toward a goal of 85% by 2015.
- Installed nine of our Solar-Powered Trash Compactor sets, to reduce collection costs and GHG emissions.
- Implemented single-stream recycling. All recyclables can be mixed together – no sorting needed.
- Won the RecycleMania Gorilla Prize (2006-2011) for having the highest tonnage of recyclables.
- Won the EPA’S “WasteWise Partner of the Year” (2007). Rutgers diverted 15,800 tons of material, saving \$840,000 in landfill costs.
- **Creating valuable environmental solutions for Arizona State University.**
- In 2007, Arizona State University (ASU) began working with Waste Management in an effort to become a more sustainable institution. The University, which was already establishing the nation’s first School of Sustainability, wanted a partner to help them reach their long-term goals while reducing their waste- related costs. The rest is environmental, and financial, history. Today, this partnership has grown into one of the nation’s preeminent examples of what happens when two forward-thinking organizations collaborate to create a leader.
- We soon began a comprehensive recycling plan that would help ASU divert more material from landfills and recover additional value through recycling. At the time, the University was sorting their own recyclables, at a cost to them. Within six months, we installed a single-stream program that changed the way the school recycled. That was only the beginning.
- In an effort to expand their knowledge and share what they’ve learned about sustainability, the University has also hosted an annual Waste Management Executive Sustainability Forum. This thought leadership event, bringing together foremost business leaders, experts in global sustainability, and academics from ASU and other institutions of higher learning, is helping to spread the word about the many benefits of sustainability and cementing ASU’s leadership role in this arena.

