



# **PROBLEM-BASED LEARNING LOW CARBON SOCIETY**

## **HYDROPOWER**

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**SMK SERI KOTA PUTERI 2  
JOHOR, MALAYSIA**



# The Importance of Low Carbon Society

## 1. To improve health and lifestyle

GENDER	CAUSE OF DEATH IN A YEAR (Malaysia)	YEAR 2015 (NUMBER OF CASES)	YEAR 2016 (NUMBER OF CASES)
MALES	Ischaemic Heart Disease	7 691	8 033 ↑
FEMALES	Pneumonia	4 396	4 637 ↑

*Source: Department of Statistic Malaysia, 2015*

# The Importance of Low Carbon Society

## 2. To increase energy efficiency

### BENEFITS OF ENERGY EFFICIENCY

### YEAR 2016 TO YEAR 2030 (Estimated Data)

1. Save hours of electricity
2. Save energy cost
3. Support jobs
4. Create jobs opportunity

**925 M MW**

**48 billion USD**

**611,000 jobs**

**6.2 M jobs**

*Source: American Council for an Energy-Efficient Economy Report*



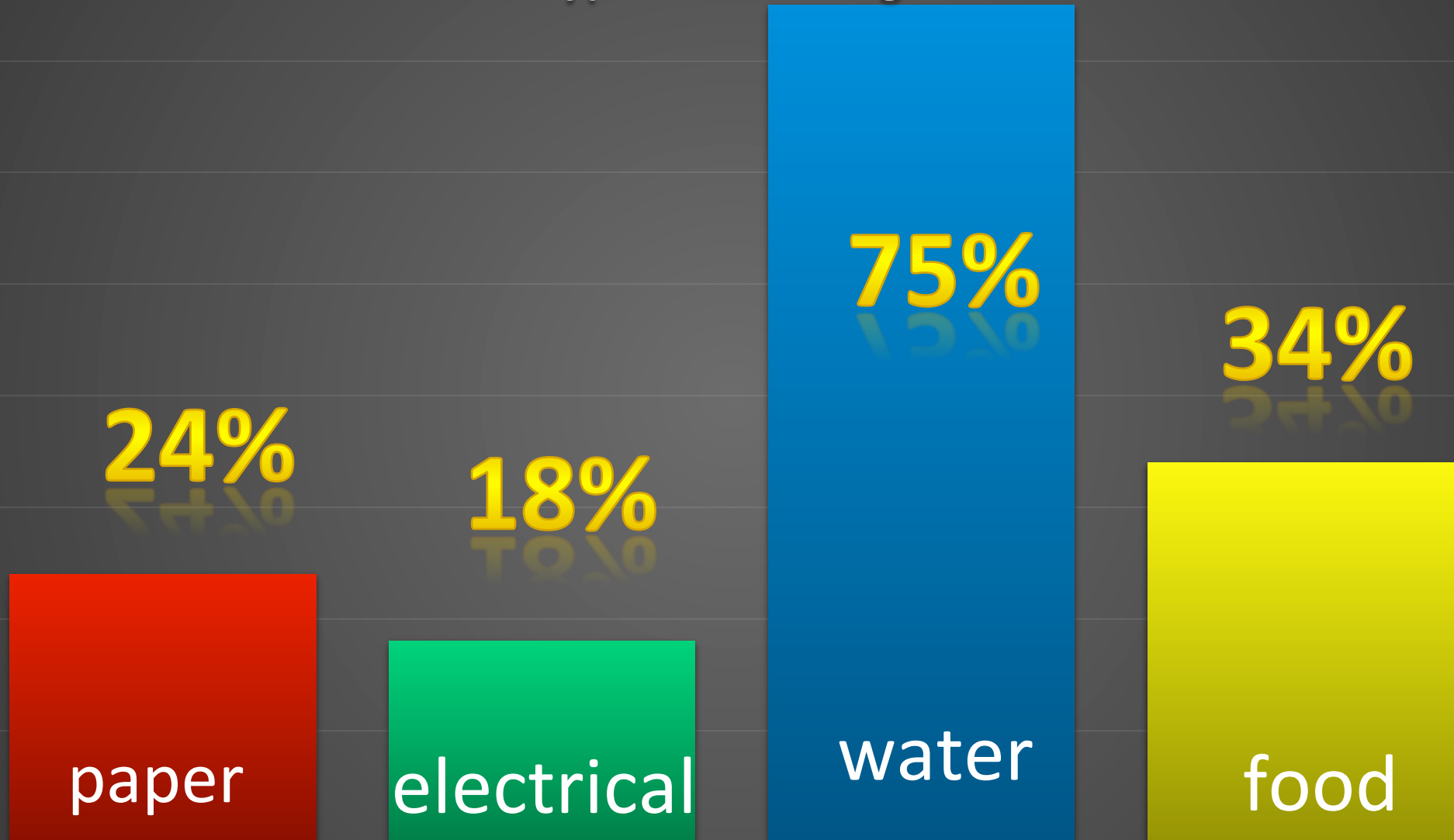


# CASE STUDY



# Findings From the Questionnaire

Types of Wastage



# Water Wastage

## LOCATION: SCHOOL CANTEEN

1. Year Operated	<ul style="list-style-type: none"><li>• 2003 until now</li></ul>
2. Facility Available	<ul style="list-style-type: none"><li>• 11 sinks<ul style="list-style-type: none"><li>-3 sinks for teachers</li><li>-6 sinks for students</li><li>-2 sinks for the canteen operator</li></ul></li></ul>
3. Break Time	<ul style="list-style-type: none"><li>• Session 1 (10.10 am – 10.30 am)</li><li>• Session 2 (10.50 am – 11.10 am)</li></ul> <p>20 min/ session = 40 min/day</p>

# PROBLEM STATEMENT



**3 SINKS FOR STUDENTS**



**SCHOOL CANTEEN**



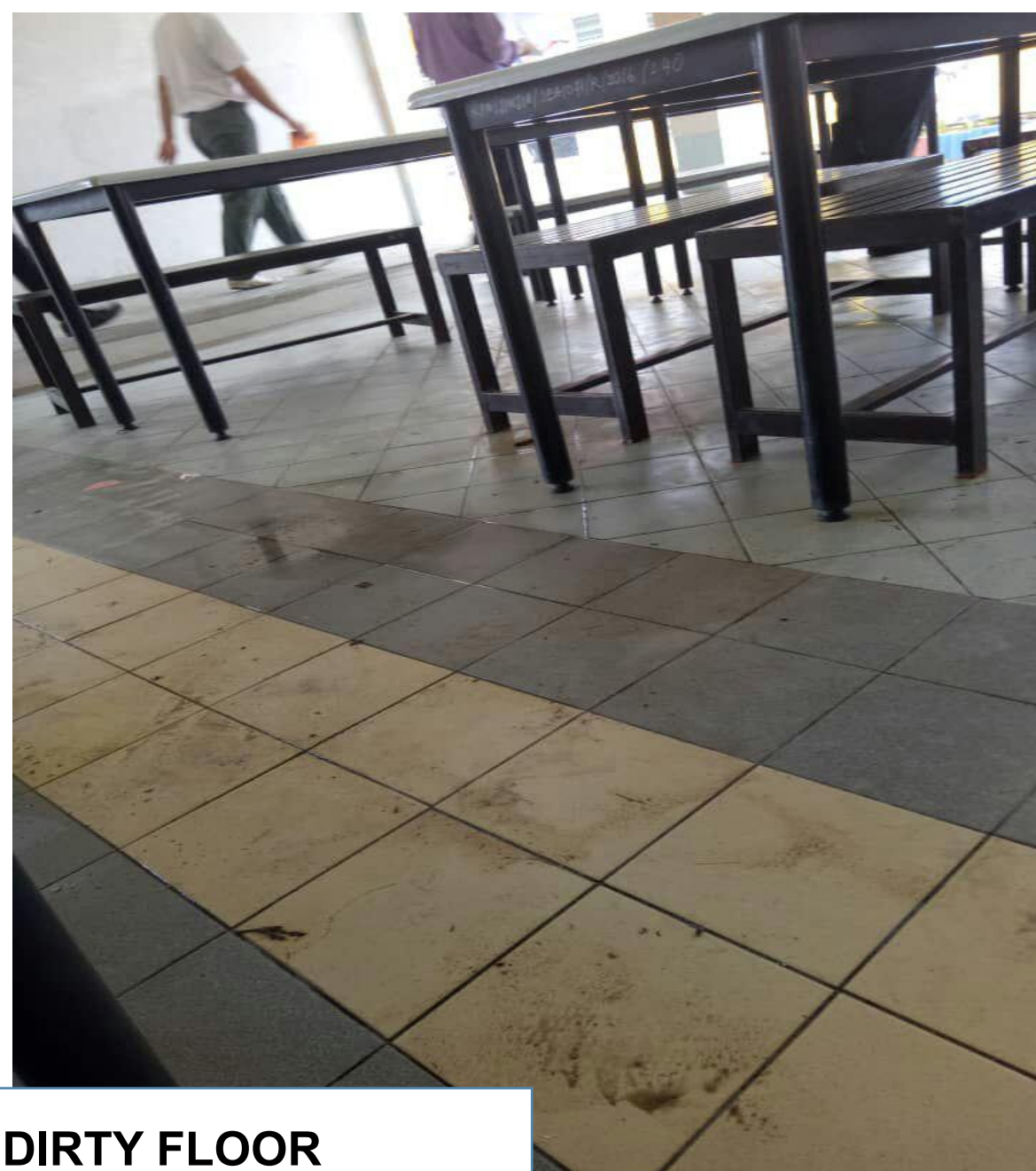
**2 SINKS FOR STUDENTS**



## WHEN STUDENTS WASHED THEIR HANDS, A LOT OF WATER WAS WASTED







**WET AND DIRTY FLOOR**

# RESEARCH METHODOLOGY

4

## **Develop hydropower Prototype** : Hydroponics and Microfiltration

Water Treatment System

- Design and Technology syllabus
- Filters and aquarium
- Watering plants

3

## **Proposed Solution:** Location, School Canteen

- Clean hands
- Lack of awareness and responsibility
- Water can be recycle : Plants in the pavements

2

## **Data Collection:** Questionnaire and Interview

- 150 students
- Hindrance to achieve LCS in SMKSKP 2
- Water wastage: School Canteen

1

## **Observation**

- Types of wastage in school



The background of the slide is a photograph of a school building with a large, light-colored dome. In the foreground, there is a garden area with a blue and red corrugated metal fence. Tall buildings are visible in the distance under a blue sky with some clouds.

# RESEARCH OBJECTIVES

To **reduce** the issue of water wastage.

To **increase awareness and responsibility** among students about the importance of water conservation.

To **embrace the practices of green living** among students and teachers.

# PROPOSED SOLUTION

## Hydropower (Concept Design)

Lemon Grass



Hydroponic System

Water Dropper



Cat Fish Tank

Microfiltration Water Treatment Principle

2

1



Charcoal Banana Skin

PVC Pipe



# The Development of Hydropower Prototype



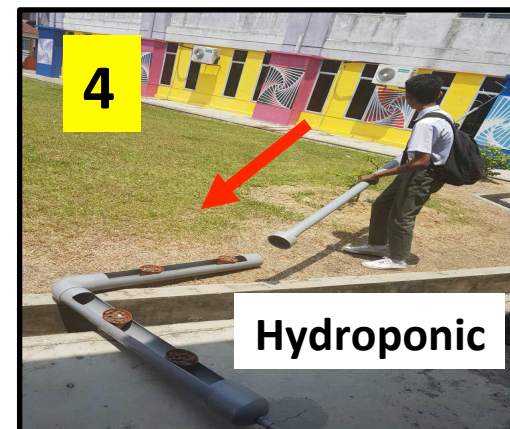
Initial work :  
measure and fit



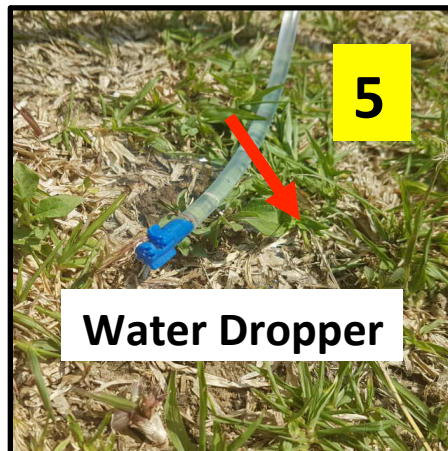
Place the filter  
under the sink



Channel water  
to fish tank



Water from the  
fish tank flows  
through the  
hydroponic  
system



Attach a  
water  
dropper to  
water the  
plants

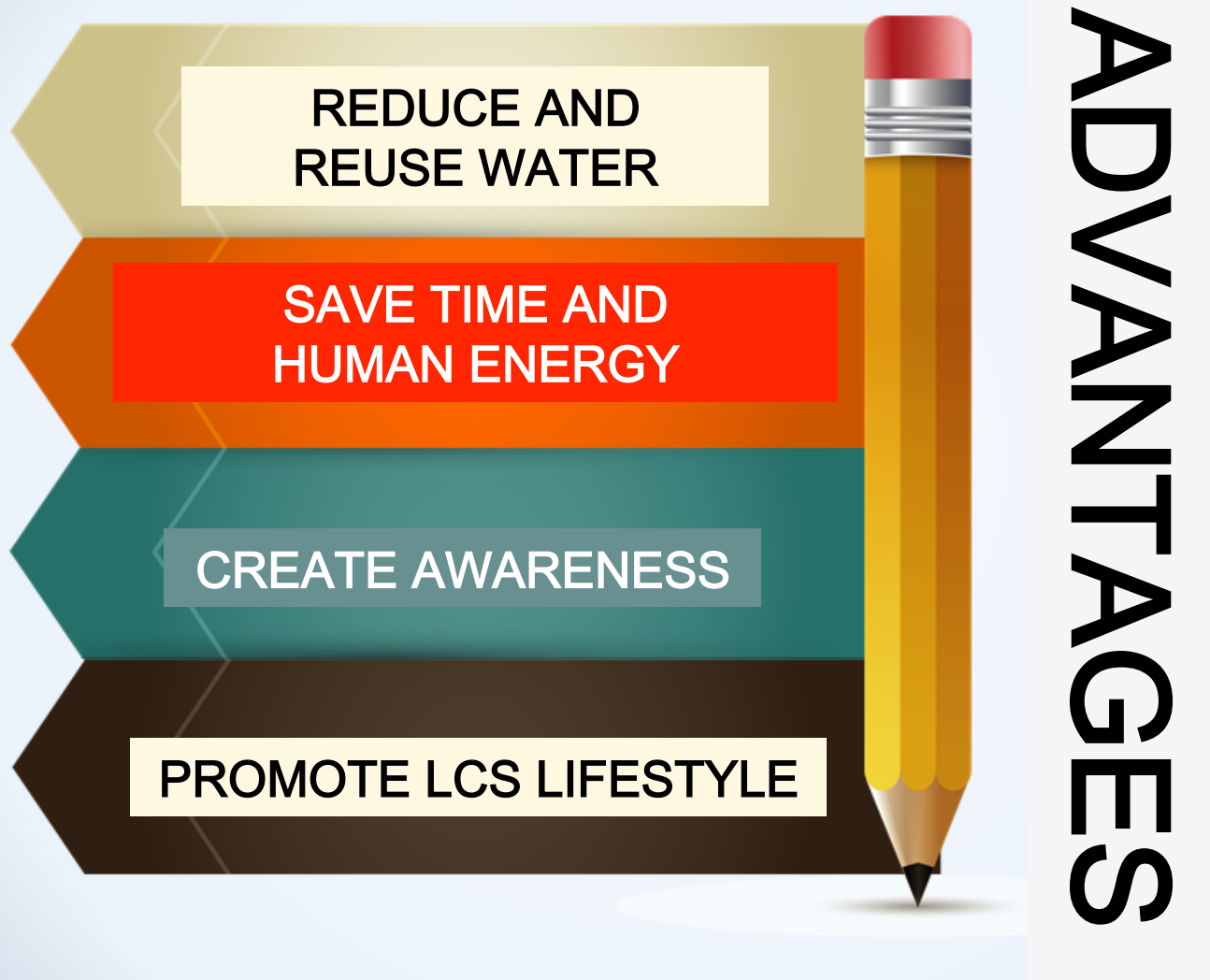


# Hydropower Cost

MATERIALS	PRICE	NOTE
1. PVC Pipes	RM 78	Sponsored by Vice Principal
2. Overflow fittings	RM 6.80	PTC (Full)
3. Aquarium	-	Donation from Uncle Jaafar (community)
4. Catfish	-	Sponsored by Form 4 Student (Jinesh)
5. Lemon grass	RM 18.00	PTC
6. Pipe Hose	RM 32.00	PTC
7. Banana Skin	-	Donated by Auntie Rokiah
8. Charcoal	RM 12.00	PTC
9. Filter tank	-	Sir Azwadi's used dustbin
10. Hydrotons	-	Used Hydrotons by the form 2 students project work
11. Small pots	RM10	PTC
<b>TOTAL</b>	<b>RM 156.80</b>	PTC

\ 4,253

# The Advantages of Hydropower System



# Post-Test Among Students on LCS Awareness

Question	Conclusion
1.What is the meaning of Low Carbon Society?	Students <b>understand the meaning of the Low Carbon Society.</b> -The communities collaborate to reduce CO2 in their daily activities.
2.What are the hindrance in achieving this life style?	Students are <b>able to relate</b> the activities that causes the hike in CO2
3.What do you understand about the Hydropower Project at the school canteen?	Students <b>understand the main concept</b> of reusing water, water filtration and hydrophonic system.




# Limitations of Hydropower System



- ✓ Maintenance during school holidays.
- ✓ Curious students disturb the fish & filtration system.

# **FUTURE RECOMMENDATION**

- 
- ① Campaign and talk about LCS**
  - ② Guidelines are attached above the sink**
  - ③ Get help from gardener**



# **CONCLUSION**

**Hopefully with the proposed solution,  
many will realise that if we use water  
properly, we will contribute to LCS.**