Our Chosen Building: Our School Building: GIIS, SMART Campus, Punggol, Singapore

This 21st Century campus is carefully crafted as a 'nest' by renowned architects from the USA, Australia and Japan, to replicate a nurturing ambience and pedagogy fostering an enriched learning journey for every student.

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Innovative Architectural Elements

Green Materials

- The GIIS canopy, made of ethylene tetrafluoroethylene, is
- Recyclable Material
- Heat and Corrosion Resistant
- Translucent Material allowing plenty of sunlight to pass through creating a bright environment.
- One of the facade materials of is terracotta, also an environment-friendly material.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Energy Savings

- Motion sensors are installed across the campus.
- Lights in the corridors and toilet clusters switch upon motion detection only.
- Air-conditioner and lights in classrooms/offices are centrally-controlled.

7 AFFORDABLE AND CLEAN ENERGY

Rainwater Harvesting

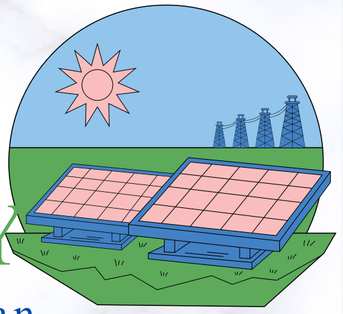
- Large storage tanks are located underground to store rainwater.
- Stored water is reused to provide water to the green landscape and water fountains.

6 CLEAN WATER AND SANITATION

AREAS OF IMPROVEMENT

Our SMART and Green campus is dedicated to lower its carbon footprint. While innovative design elements are already in place, there is always room to introduce additional features that further enhance our sustainability efforts and make our campus more eco-friendly.

1 MAKE USE OF RENEWABLE ENERGY



7 AFFORDABLE AND CLEAN ENERGY

Certain areas of the building can be utilized to harness clean and renewable energy to further improve the energy efficiency of the SMART Campus.

2 GREEN INFRASTRUCTURE

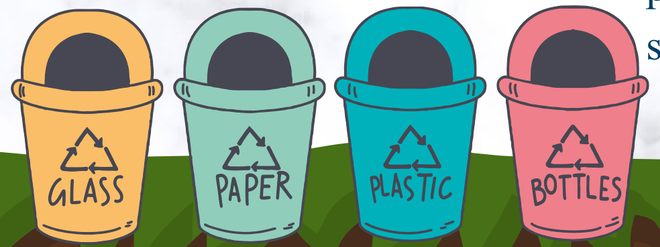
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Resonating with the campus objective of green living, green infrastructure can be introduced indoors to promote healthier environment.

3 SOLID WASTE MANAGEMENT

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

In addition to managing water usage, solid waste management is also a key component of Green Design. We propose to implement an efficient solid waste management system.



ENERGY MANAGEMENT

Rooftop Area on Level 7

Key Existing Features

Receives plenty of sunlight, air and water during rain

Large Area

Shortfalls:

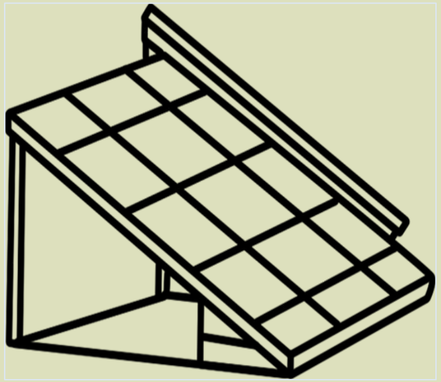
- Not a productive use of a huge area.
- Receives plenty of sunlight which is not utilized for any purpose
- Noticeable Lack of greenery despite sufficient rainfall
- Closed for a long time, leading to dust accumulation.

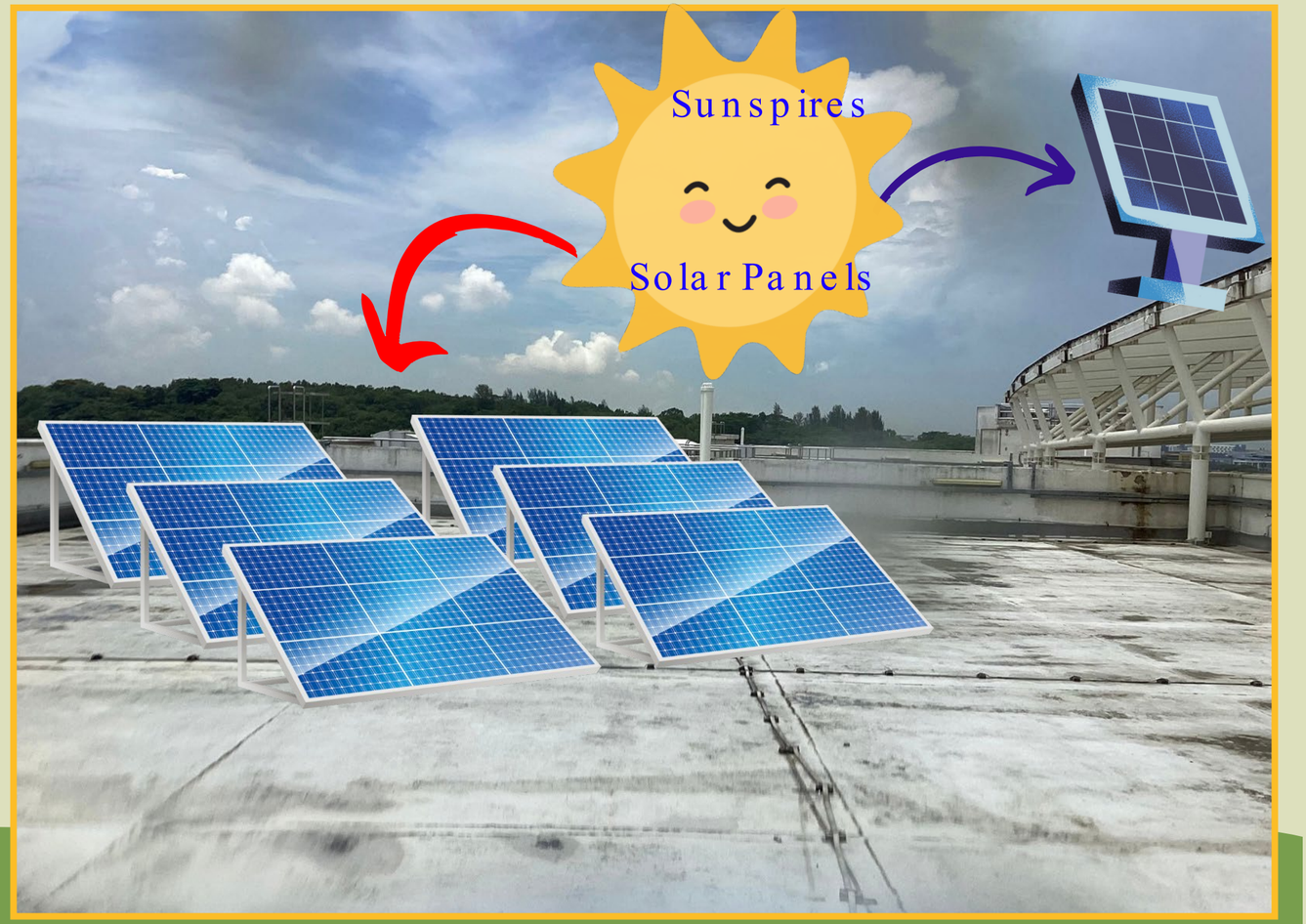
How to make optimum utilization of this barren space within our campus so as to harness the Renewable ENErgy effectively?

Introducing SUNSpires

Our Proposal

- Install solar panels for harnessing renewable and clean energy
- Make our building more energy efficient with a lower carbon footprint.





Utilizing the sunspires Effectively

Then how do they serve during night?

Solar Battery Storage

- By installing solar batteries together with solar panels, we can receive energy during the night too.
- The extra energy generated during the day is stored in solar batteries.
- When solar panels are in sleep mode, the energy stored in the solar battery is utilized to power a chosen location.

The sun's position is constantly changing in relation to the Earth.

- Solar panels should be slanted ideally towards the south.
- They must be tilted at an angle of about 10-15 degrees.
- This practice allows longer exposure to the sun, so that maximum amount of energy to be cultivated.
- The tilt also promotes self-washing by rain.

how should the solar ENERGY be used in the Campus?

LIBRARY KIOSK

During the day, the energy generated can power up the library kiosks so students can borrow books.

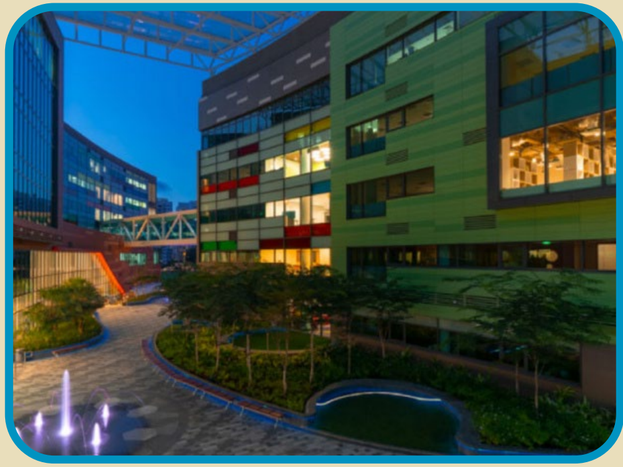
IT LABORATORY

The energy generated can power up the computer systems in the IT labs within the school for students to use.

SOLAR SHADING

Solar panels can act as a shading device providing a cooling effect in classrooms, decreasing usage of AC and therefore, lowering the carbon - footprint.

INDOOR LIGHTS



During the night, when much energy is not needed, it can power up some indoor lights for the staff who stay back .

2. Eco-friendly Design: Green Infrastructure

ADMInistration AND RECEPTION AREA

Key Existing Features

Well-lit by both Natural & Artificial Light

Colorful Furniture Complements the ambience

Spacious

SHORTFALLS

- Can get overcrowded during drop-off times, pick-up times and school events, making the place warmer.

- Lack of indoor greenery despite being well-lit and air-conditioned.
- Overcrowding can lead to higher energy consumption due to increased use of air-conditioner.

How to introduce green infrastructure to enhance eco-friendliness and promote well-being in the school environment?

OUR ACTION PLAN

INTRODUCE A GREEN CEILING

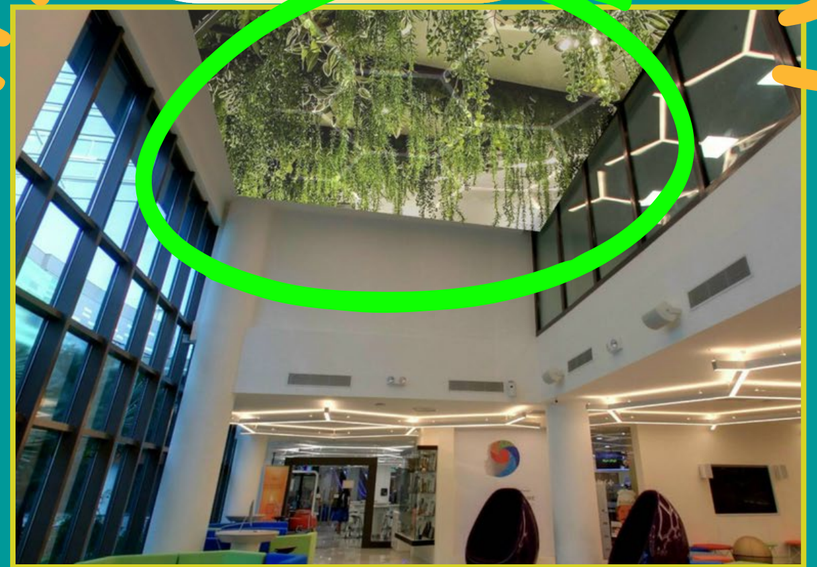
A Green Ceiling is a sustainable way to improve the indoor environment

Benefits

Air Purification

- Ceiling plants like moss and fern play a major role in removing carbon dioxide and releasing oxygen in an area.
- Plants can remove significant amounts of airborne pollutants.

Green Ceiling as envisioned



Physical Health and Mental Wellbeing

- Students, teachers and staff can experience fresher air from plants improving their health.
- Greenery in the environment offers relaxation. Can help students and staff keep calm throughout the day

Energy Efficiency

- Ceiling plants can absorb the natural light and therefore, can have a natural cooling effect.
- Reducing indoor temperature implies less usage of air-conditioner and therefore, reduction in building's energy use.

SUITABLE PLANTS FOR THE GREEN

While choosing a plant for a specific purpose, we must think about the practicality, feasibility, and maintenance level...

Features of Moss:

- Doesn't require much water, sun exposure, or high-quality maintenance.
- Can absorb sound
- Can absorb large amounts carbon-dioxide, and purify surrounding air

Aha! Low maintenance plants like moss and fern will be perfect for the green ceiling!

Cat ladder

How to maintain the Green Ceiling?

- Watering, pruning and fertilizing plants high up on the ceiling is a difficult task.
- This task could be accomplished by employing green landscape specialists, who can use a cat ladder to reach the ceiling.
- Mosses don't require frequent care. So, maintaining them should be technically and economically feasible.

3. Solid Waste Management

THINK BEFORE YOU THROW OUT

In keeping with Singapore's Solid Waste Management System, our school has recycling and waste disposal stations at strategic locations including our canteen and Maker Space.

Here's some common mistakes when it comes to recycling !

- Tissue paper ends up in bin meant for recycling metal cans.

- Food waste and plastic cutlery ends up in the bin meant for recycling paper.
- Disposable paper cups contaminated with food waste ends up in a recycle bin.

- Disposable paper plate ends up in a bin meant for recycling plastic.

PROBLEMS IDENTIFIED

- Lack of knowledge and awareness on what are recyclables and what are non- recyclables.
- Improper sorting of recyclables during disposal will disrupt the operation of a recycling facility.

HOW TO CREATE AN EASY-TO-FOLLOW AND EFFICIENT PROCESS FO DISPOSING IN RECYCLING BINS?

INTRODUCING THE SMART BIN

Main Idea:

1. Reduces contamination of recyclables
2. Convenient sorting of recyclables
3. Raises awareness of students and staff on what can be recycled and what cannot

- Has light sensors and LED light indicators of specific colors above each waste disposal opening
- Provides real-time feedback to prevent mistakes from happening during disposal.

- Refuses to open when it detects contaminants or incorrect recyclables are being placed in that container.
- Colors of light indicate the user whether the waste or recyclables are being disposed in the incorrect container.

SMART BINS WILL BE FANTASTIC ADDITION TO OUR TECH-SAVVY "SMART CAMPUS" FOCUSSED ON SUSTAINABILITY

Our Green Campaign

Culinary Cultivation Hub

- This greenhouse could grow plants that suit SG's climate like celery, microgreens, beans etc.

going ZERO WASTE

We must convince the building's occupants, who are students and teachers, to implement our ideas towards sustainability.

- We hope to raise an awareness among students in harnessing solar energy to power hydroponic systems in school.

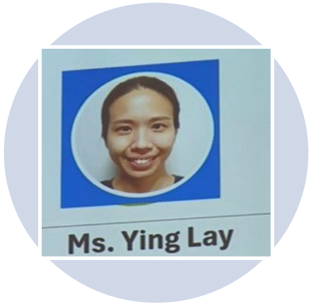
- Our fresh produce grown on-site can be used for culinary CCA and perhaps in our cafeteria too.

Summary

- GIIS Punggol SMART Campus showcases innovation and sustainability in architecture.
- Uses eco-friendly materials and efficient energy systems.
- We propose to introduces new features such as:
  - Solar panels
  - Smart waste management
  - Green ceiling
- Reduce carbon footprint and operational costs.
- Enhance the well-being of the building's occupants.
- Encourage students, teachers and staff to remain committed to:
  - Fostering a greener future through education.
  - Promoting all possible sustainable practices proactively.

Acknowledgement

THANK YOU FOR YOUR KIND ATTENTION !



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