

## Understanding of Sustainability

Sustainability is the avoidance of depletion of natural resources to maintain ecological balance. (*Google Dictionary*)

People are aware that the Earth's resources are not limitless, yet we continue to use them at an unsustainable rate.

Such exploitation of natural resources has led to many arising issues. Taking deforestation as an example, it can cause animals to lose their habitat which may lead to species extinction and biodiversity loss. In addition, it results in air pollution that contributes to global warming and health problems. Despite these negative impacts, deforestation rates have been increasing every year at an alarming rate. In fact, Southeast Asia has the highest deforestation rate in the world. This shows the need to bring attention to how careless and excessive consumption can lead to devastating consequences.

The nature can be harmed in many ways and is happening every minute. Actions that appear insignificant such as trampling on the grass to the burning of forests can be harmful to the environment.

Hence, our group would like to emphasize on the fragility of our ecosystems, and highlight the importance of protecting the natural environment through our display.

## Overview

The display is that of a mini forest, with a walkway in the centre for people to walk through. What we would like to highlight with it is how the action of humans may have dire consequences to the nature.

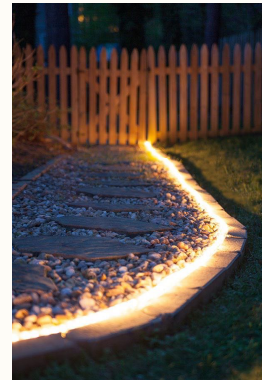
- Technical
  - The actual display will be a rectangular-shaped garden with a designated walkway that is easily identified by the LED lights that are placed on the two sides of the walkway.
  - Garden will be decorated with LED lights and LED strips on the plants (made of recycled materials).
  - As a plant senses an object coming close to it, the lights on the plant will slowly dim and eventually turn off.
  - This effect can be achieved by using a **Infrared Distance Sensor**, GP2Y0A21YK0F.
- Environment Factor
  - This project will be built from recycled materials. They will be used to form the structure of the forest.
  - Materials such as plastic and glass bottles, aluminium cans and bamboo poles will be used.
  - Some ideas to use the recycled materials:
    - Plastic bottles can be redesigned to shape like a rose.
    - Fairy Lights can be used to represent the grass.

- Bamboo poles can be used to form the structure of the tree trunk.
- Interactive Component
  - The idea behind this display is to show the impact of human activities on the natural environment.
  - The proximity of the person to our display would embody the severity of human actions to the natural environment. The closer the person is to the display, the more severe the human activities are.
  - As a person walks through the display, the distance sensors in the forests would sense an object (the person) coming close to them. The LED lights on the plants near the sensor will then dim.
    - This is to signify the human activities having an adverse impact on the forest, and the plants are losing their vitality.
  - When the person goes close to a particular part of the display (within 10cm), the distance sensors would sense it and that portion of the LED display will completely turn off.
    - This would represent when humans intrude upon our nature too excessively, the plants will die. The death may be directly due to humans killing it (logging, burning of forests etc.), or our actions making their habitats unlivable.

DIP Group 1

# Guarden of Illumination

- LED lighted garden with a variety of plants
  - Made of recyclable materials
    - Glass/Plastic bottles
    - Soft drink cans
    - Bamboo poles
  - Decorated with LED lights
    - Along the pathway and on the plants
  - Distance sensors to detect objects approaching the plants
    - When at a certain distance, lights will dim
    - Lights will completely turn off when object is close



# Technology

- IR Distance Sensor (GP2Y0A21YK0F)
  - Sensor reads a value when the object is at a certain distance
  - Lights will slowly dim as the object approaches the tree
  - At a certain distance, the lights will turn off





# Inspiration

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- Nature inspired based on next year's *iLight* theme, Sustainability
- Symbolize the **death** of the plants
- Educating people to protect the nature of Singapore
- Raise awareness on how delicate lives of plants are



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