Sikaru Saathi

[Repair 1 : Multiplug, UpCycling]

A little background of this lesson:

- Welcome to the fourth day of the Sikaru Saathi Bootcamp! Over the past three days, you have learned about dismantling, the basics of electronics, and soldering and desoldering techniques. Today, we will be putting all that knowledge to the test as you learn how to repair a multiplug.
    - In today's class, you will have the opportunity to expand your knowledge on repairing multiplugs by utilizing a multimeter to test continuity and receiving guidance from an expert on diagnosing and fixing issues. Additionally, the class will cover the concept of upcycling and its application to e-waste.
    - The skills you have acquired over the past few days will enable you to diagnose and fix any issues with the multiplug, such as loose connections or faulty components. This activity will not only give you practical experience in repairing electronic devices but also help you understand the importance of proper maintenance and repair in extending the lifespan of electronic devices and reducing e-waste.
        - So, let's roll up our sleeves and get ready to repair some multiplugs!

Materials Required

Component Name	Number
Universal	
Speaker system (Optional) (Using this to play music when participants are working in stations)	1
Per Group	
Dismantling Station	1
Multimeter	1
Multplug (E-waste)	1

E-waste iteams (LEDs, PCB plates, wires, motors, fans etc.)	
Repair Kit	1

Repair Kit contains:

- Multimeter
- Soldering Kit (Soldering iron, Stand, tin, wax)
- Wire cutter
- Pliers
- Electrical Tapes
- Saftey gloves
- Saftey goggles
- Hammer
- Hot Glue gun
- Screw Driver set

Curiosity

[Curiosity is an essential element of learning, and in this section, we will aim to engage participants with questions that encourage curiosity and critical thinking about today's lesson.]

- Are you familiar with the process of repairing electronic items?
    - If so, what kinds of electronic items have you repaired in the past?
- Have you experienced any issues with damaged multiplugs in your home or office?
    - When faced with a damaged multiplug, do you typically discard it or attempt to repair it?
- What are the necessary repair tools required to fix a multiplug?
    - Can you name some of the essential items needed to repair a damaged multiplug?

Activities

Energyzer

- Pick a fun game that will allow students to get to know each other and play it with the students. We recommend games that require physical movement so that the students get energized.

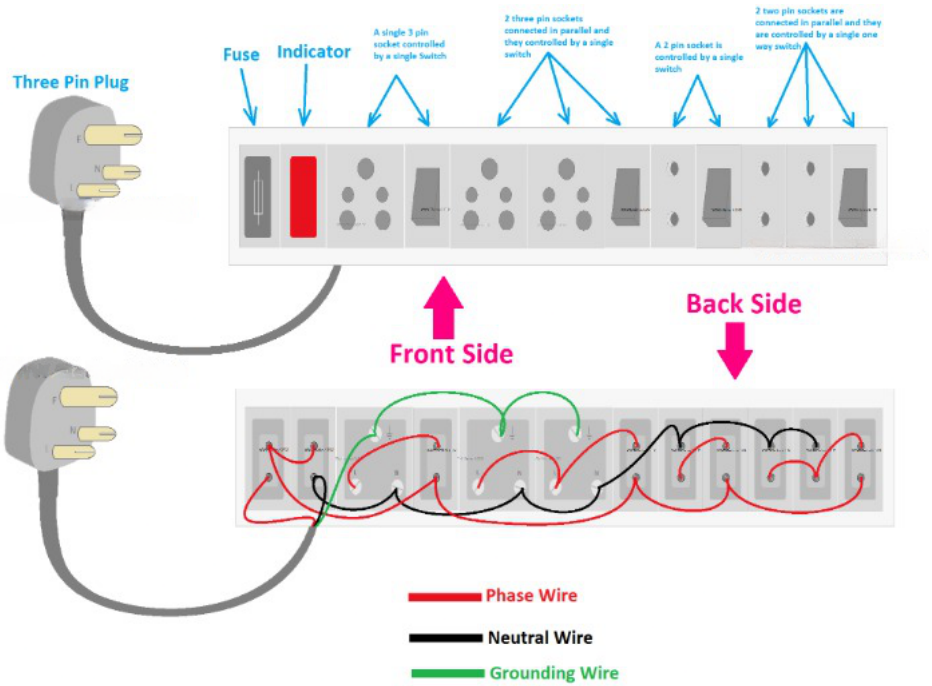
Recap of previous class

In the previous class, participants learned about soldering different components, including the different soldering techniques used for specific components. They were introduced to the tools required for soldering and also learned about desoldering.

- How do you properly solder two wires together?
    - As a facilitator also look for answers about safety precautions

Repairing Multi Plugs

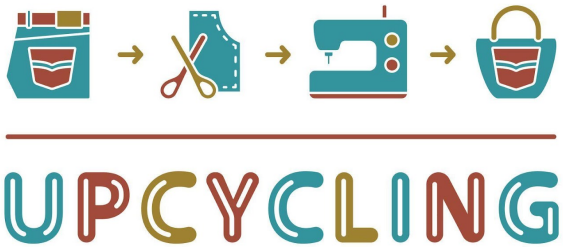
- Before jumping into the activity, facilitator needs recaps "**understanding electronic components"** portion from day 2 where students learned about:
    - Polarity of battery/electricity
    - Making simple circuit where students connects switch, led and battery
- Now Facilitator invites an expert and Here are some instructions to give to participants before introducing how to repair a multi-plug:
    - **Safety first:** Ensure that the power is turned off and unplugged before attempting any repairs. Always wear safety gloves and protective glasses while working on any electrical appliance.
    - **Identify the problem:** Before attempting any repairs, it is important to identify the problem with the multi-plug. Check to see if the plug has a loose connection or if the wiring is frayed or damaged.
    - **Get the necessary tools:** For repairing a multi-plug, you will need a screwdriver, wire cutters, wire strippers, electrical tape, and replacement parts if necessary.
    - **Follow the wiring diagram:** Multi-plugs have different wiring configurations. Be sure to consult the wiring diagram to ensure that you connect the wires correctly.



- Now the facilitator provides the **Repair kit** that was made for the class and Introduces all the items and working of all the materials to the participants
- Let experts explain all the above points and let participants experiment by repairing old multiplugs that were collected at the beginning of the session.
    - **Note to Facilitator:** Today participants are working with AC current so they need to be extra careful with the repair.
        - **Have these practices in class**
            - to always call the expert/facilitator and show their work before testing
            - to always find right screwdriver while dismantling multiplug
            - to always do a continuity check to diagnosis problem in the multiplug
- [**Video on How to repair Multiplug**]

Upcycling

- Facilitator asks a simple question about "**Upcycling?**"
    - Have they ever used the word before? If so, what is it? Where have they heard this word?

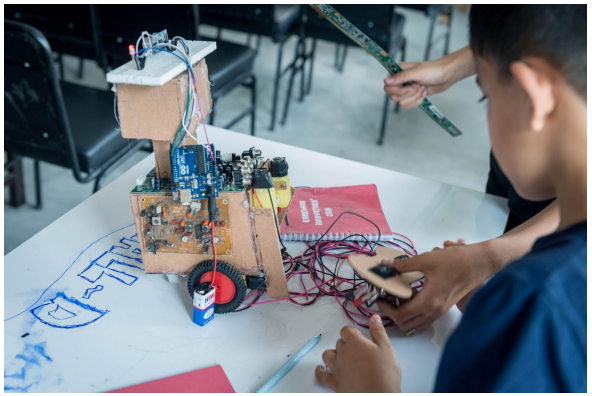


Upcycling is the way of transforming or repurposing discarded or unwanted materials into products or items that are of higher value or quality.

As seen above an old pants is reused and transformed to make a tote bag.

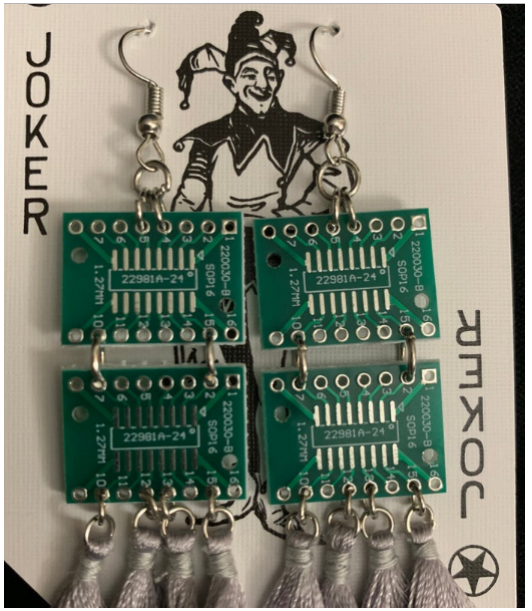
- Facilitator shares some examples of e-waste upcycling.

Using a old PCB plates as architectural design



Use of old electronic parts from e-waste and turning into a robot

Using an old CPU case in a form of dust bin



Using old PCB plates as earrings

- Now that participants have some idea about what Upcycling means, the Facilitator divides students in groups of 3 and asks them to brainstorm ideas for upcycling their items.
  - Encourage them to think creatively and to consider ways to combine different items to make something new.
  - Provide participants with tools and materials for decorating and assembling their upcycled products.
  - Facilitator can circulate around the room, offering guidance and suggestions as needed.

Introduction to problem statement

- Facilitator share the problem statement of this bootcamp as follows:
  - It's the year 2200 and humans have abandoned earth. It has become covered with trash from products sold by powerful companies, and we ran out of resources to grow food, build buildings, and create the electronics that make our lives convenient. We now live in a rocket

ship slowly traveling in the atmosphere, searching for another planet that can support life. WALL-E, a garbage collecting robot, has been left on Earth to clean up the mess so that humans can once again inhabit the plant. WALL-E is a curious robot, often playing with the electronics he discovers. WALL-E is alone on Earth so he frequently feels lonely. When he has free time, he tinkers with parts to try and create something useful to his life or to create a toy that can keep him entertained. WALL-E looks for useful electronic parts to add to his inventory to invent new things. Help WALL-E by scavenging through junk to find parts and creating new inventions to keep him entertained!

    - This is adapted from the movie WALL-E so you can play the **trailer** for participants to better understand.
        - You can also ask participants watch the movie to get better understanding of the problem statement

- After introducing the problem statement, you can then provide more details about the task at hand and what students are expected to do. For example:
    - "Your task is to scavenge through junk to find useful electronic parts and create new inventions to keep WALL-E entertained. You'll need to be creative and resourceful, and use your knowledge of electronics to come up with new and innovative ideas. This is a chance for you to explore the world of electronics and put your skills to the test. Are you ready to help WALL-E and embark on this exciting adventure?"

Reflection

- Now participants need to share what they have been working on so far.
    - Have each group present their upcycled product to the class, explaining the materials used and the inspiration behind their design.
- Discuss how upcycling can help reduce e-waste and the importance of responsible disposal of electronic devices.