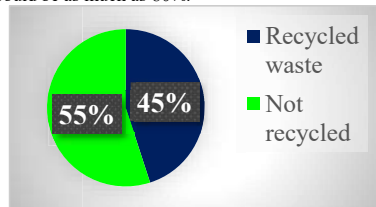


# Domestic Waste Organiser

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## The Problem

- Incorrect disposal of household waste.
- The UK produces 31 million tonnes of household waste per year with only 45% of that waste recycled.
- However this figure could be as much as 80%.



## How will a DWO help?

- The recycling rate is often reduced because of people not knowing where waste items should go.
- This leads to contaminated recycling ending up in landfill.
- A device which identifies waste materials removes the possibility of not knowing where items should be disposed of.



## Objectives

- Conduct research on existing waste organization methods.
- Select a suitable processing platform.
- Identify material properties for common types of domestic waste.
- Select sensors which can respond to the material properties.
- Build an outer casing which creates a controlled test environment.
- Identify waste types and display on an LCD screen.
- Create a product specification.

## Microcontroller & Sensors



### Arduino Mega 2560

- Compatible with a wide array of sensors.
- Low price.
- Arduino programming language.
- More input and output pins than other Arduino models
- More memory than other Arduino models



### Weight sensor

- Weighs waste sample.
- Weight reading lets the system know a waste sample is present.



### Inductivity sensor

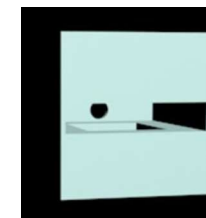
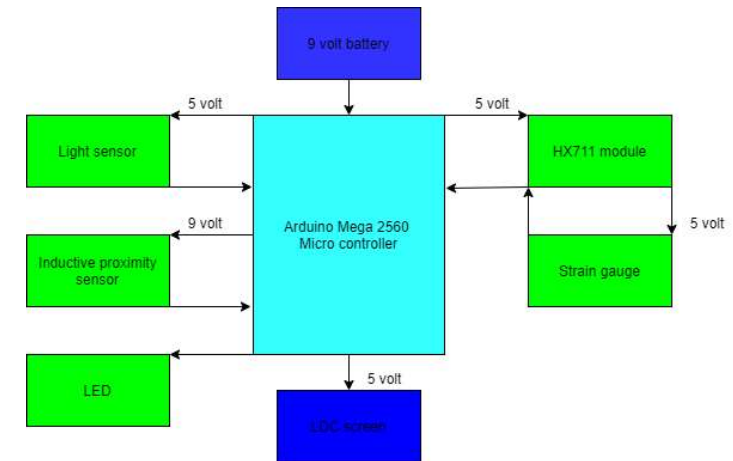
- Detects whether the waste sample conducts electricity
- Detects metallic samples.



### Light sensor

- Detects light
- Used to detect how much light can pass through a sample.

## Design



### Outer casing

- Shelf for the samples to rest on and be weighed
- Back hole for inductivity sensor.
- Hollow window on shelf for LED light to shine from the roof to the light sensor on the floor.
- Minimise ambient light reaching the light sensor.

## Waste Material Properties

Material	Optical	Inductance	Density (kg/m <sup>3</sup> )
Glass	Transparent	Electrical Insulator	2440
Paper	Translucent	Electrical Insulator	808
Cardboard	Opaque	Electrical Insulator	996
Plastic (PE)	Transparent	Electrical Insulator	939
Metal (aluminium)	Opaque	Electrical conductor	2630

## Future work

- Develop mechanical robotics elements which would sort the identified materials into separate home waste disposals.
- Refine and expand the capabilities of the project by identifying more material types.
- Additional audio reader which could be used as a tool to help those with sight difficulties.