From: lMGreen@renewplc.com
To: research@greengrp.co.uk
Subject: Sorting and Recycling

Dear Research Group,

We are a recycling facility who separate and sort household and industrial waste materials before crushing them and sending them to treatment plants to be processed and recycled. The materials we sort are: aluminium, steel, glass, plastic, paper and card and mixed materials (e.g. some vehicle parts or circuit boards).

We have problems sorting so much waste by hand. We would like your help to improve the following recycling processes:

- Separating aluminium and steel cans. These are sorted using magnets, but we need to find a more efficient way to use the magnets.
- Crushing cans for transport.
- Efficient movement of materials from one area of the site to another.

We need you to:

1. Find out how to separate the different materials, in particular steel and aluminium.
2. Explain the most efficient way to crush the cans/containers (taking their shape into account).
3. Investigate suitable material for our conveyor belt to move waste from one process to the next.
4. Find out more about what happens to materials when they go from us to the treatment site to be recycled (e.g. paper).
5. Design a poster to make the public aware of the benefits of recycling or disadvantages of not recycling.

We look forward to hearing from you with your results.

Isla Green

Research manager – Renew plc

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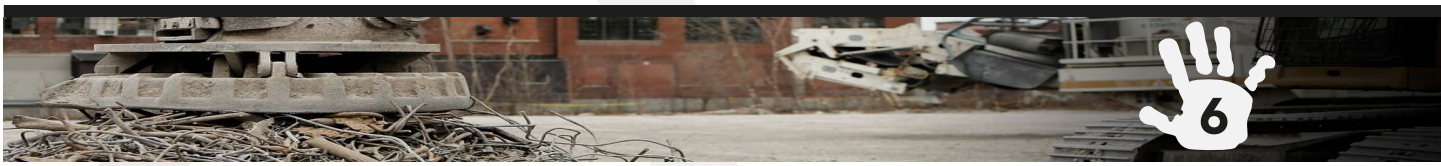
Disclaimer

This email transmission is confidential and intended solely for the organisation to whom it is addressed.

Activity Sheet 6: Magnets in the recycling process



Which types of metals do magnets attract?

Challenge

To separate as much magnetic waste as possible in 30 seconds.

You need

- A pile of mixed waste (paper clips and other materials)
- Two magnets
- Other useful equipment (thread, paper, sellotape, scissors etc.)

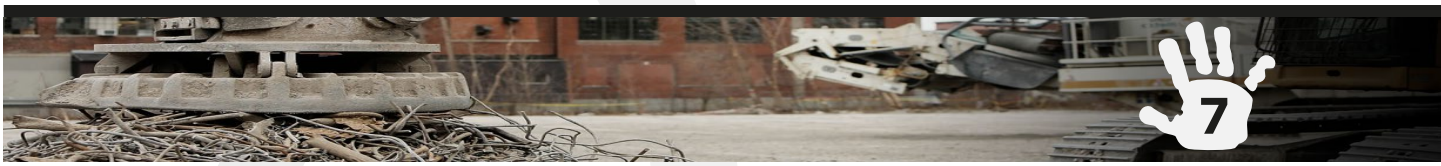
Plan

In your group decide the best way to separate the steel or iron from the other waste.

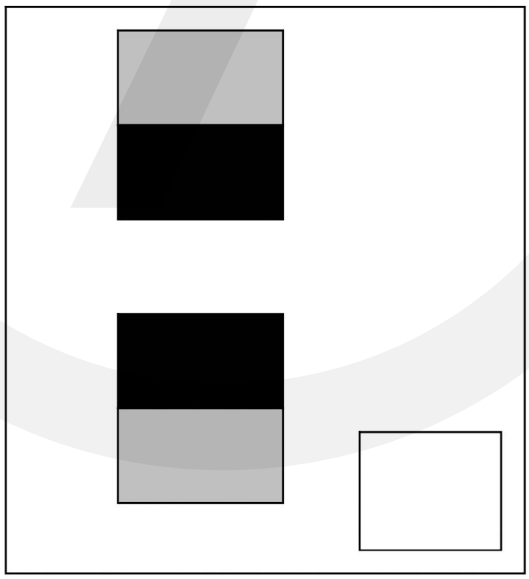
Diagram

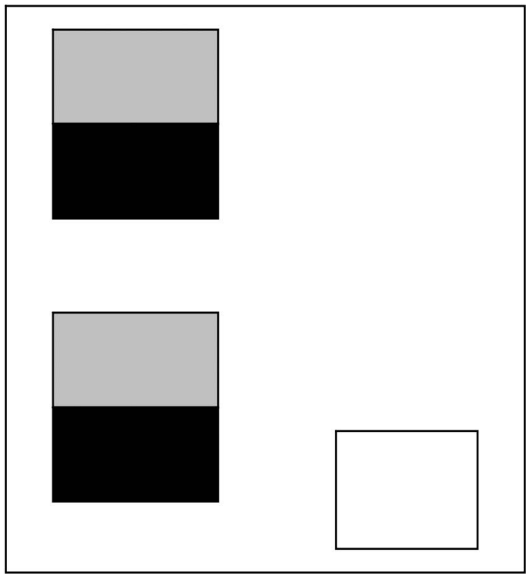
Add arrows to show the direction of the forces and label them (magnetic force and gravitational force).

Activity Sheet 7: Magnets in the recycling process part 2



Draw arrows on the force diagrams to show the directions of the magnetic forces.





Tick the diagram where the magnets are working together and cross the diagram where the magnets are working against each other.

Results	Number of paperclips
My Group	
The highest number	

Record you results from magnetic sorting here.

What did the best group do to separate more paper clips?
What problems could arise if you use more than one magnet in the same separating machine?