

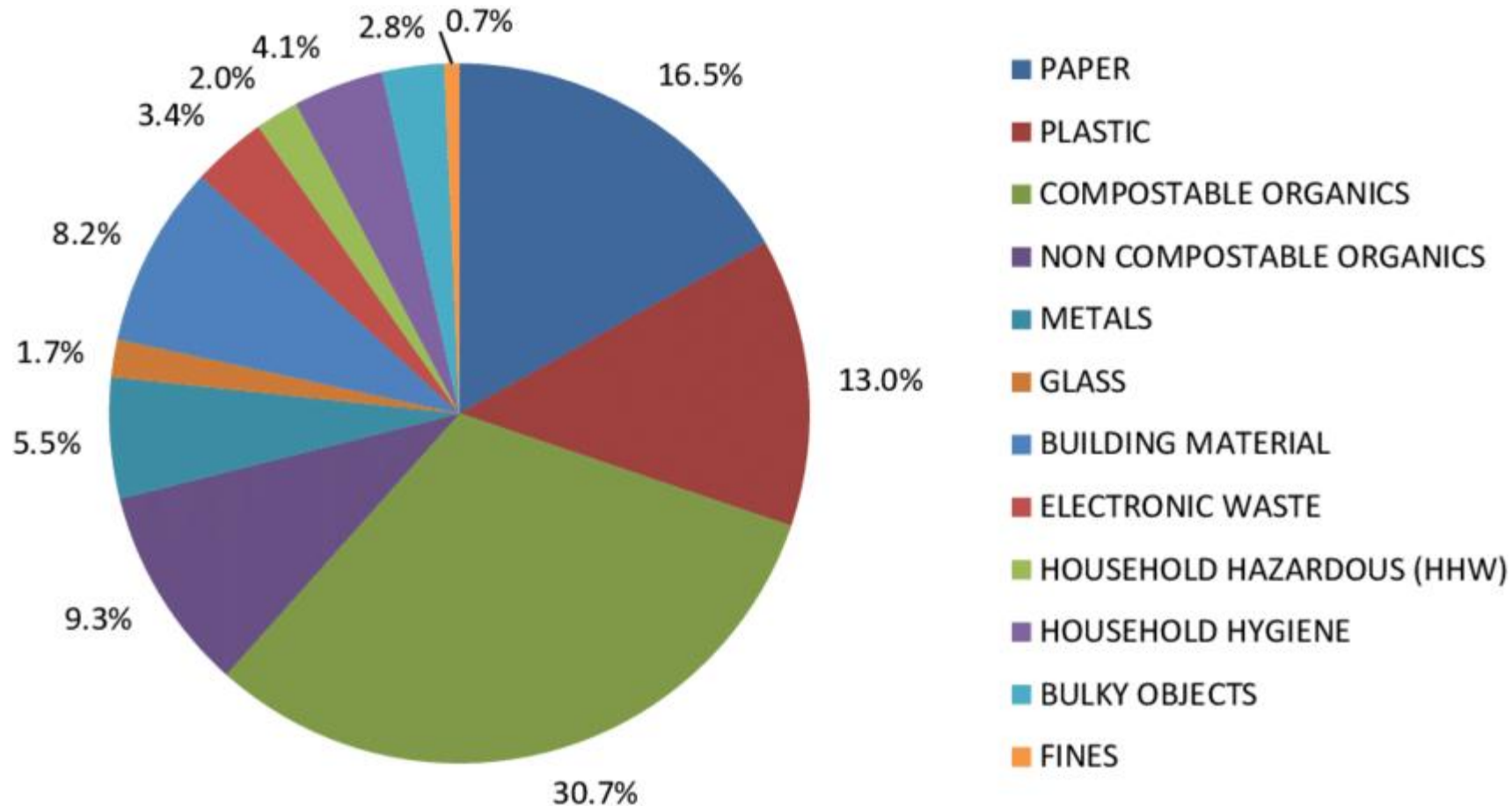


STEP 06: WASTE COMPOSITION ANALYSIS

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Waste Composition Analysis



Game

A white line-art icon of a clipboard with a yellow hard hat in the center. The clipboard has a clip at the top and a sheet of paper at the bottom with a folded corner.

Phase 1: Operational Preparation

Assemble and Brief the 15-Person Survey Team

Waste characterisation is a coordinated effort. The team must be aligned on the aims, the steps, and the strict health and safety protocols before stepping onto the site.

The Pre-Shift Briefing:



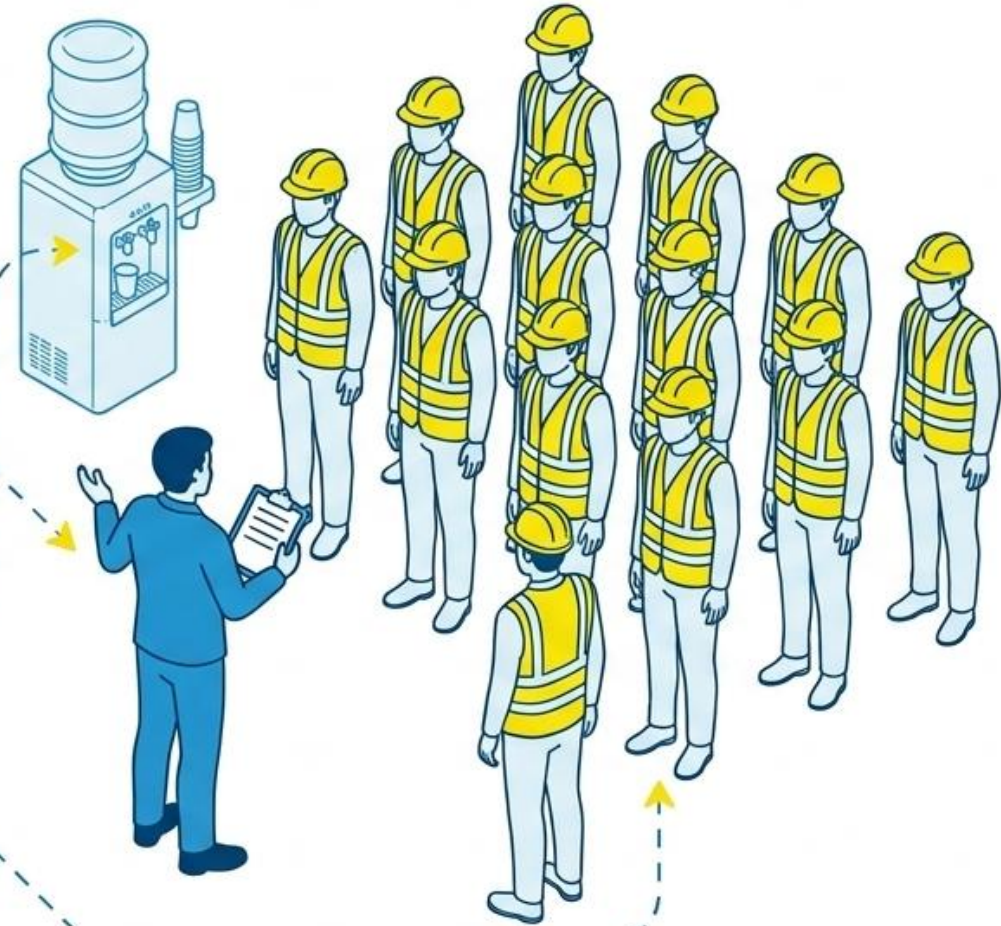
Aims & Steps: Outline the specific goal for the day and the chronological workflow.



Hydration & Rest: Mandate scheduled water breaks to prevent dehydration in the field.



The Golden Rule: Emphasise that sorting is hazardous; safety protocols are non-negotiable.



The Operator Loadout: Mandatory Personal Protective Equipment

Sorting waste poses physical and biological hazards. Complete personal protective equipment (PPE) is strictly required for every team member on site.

Core Protection:



Hat or cap
(sun and dirt protection)



Protective glasses
(eye protection)



Protective glasses
(eye protection)



Face mask
(respiratory protection)

Body & Extremities:



Long-sleeve shirt
and long trousers



Heavy-duty apron
(stomach protection)



Thick protective
gloves



Rubber safety boots
(steel toe caps if required)

Hygiene & First Aid:



Soap, hand sanitiser,
and surface disinfectant



Comprehensive first aid kit
(must include an eye bath)



Rubber safety boots
(steel toe caps if required)



The Tool Kit: Equipping the Survey Station

Bring the exact tools required to measure, manage, and process high volumes of waste efficiently.

1 Measurement & Recording:



Hanging weigh scale (up to 100 kg capacity)

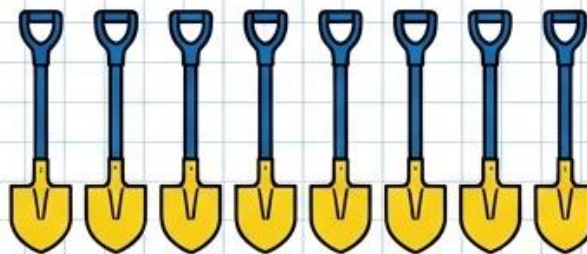


Pencils, notebooks, and 3 official recording sheets

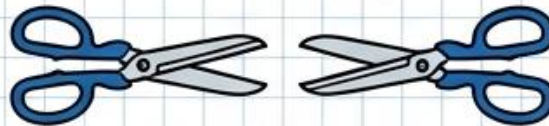


Camera or smartphone for documentation

2 Handling & Processing:



8 durable shovels



2 pairs of heavy-duty scissors



2 stiff brooms

3 Containment & Storage:



2 thick plastic tarpaulins
(minimum 5 x 5 metres)



24 waste containers or heavy-duty liner bags
(60 Litre capacity)

The Golden Rule: The Safety Stop



If any medical waste, clinical sharps, or unidentifiable hazardous materials are spotted in the sample, the sorting procedure must stop immediately.

Do not handle. Do not drain. Do not attempt to classify.

Phase 2: Execution and Analysis



Sourcing the Sample

Before sorting, we must isolate a representative, pure sample of Municipal Solid Waste (MSW) directly from the incoming delivery trucks.



Critical Safety Check: Ensure absolutely no personnel are in proximity to the falling waste during the unloading process.

The Challenge of Scale

We now have a 300 kg pile of municipal solid waste on the tarpaulin. Sorting 300 kg by hand is inefficient, dangerous, and physically exhausting for the survey team. To conduct an accurate composition analysis, we need a highly representative, mixed sample weighing exactly 50 to 70 kg.



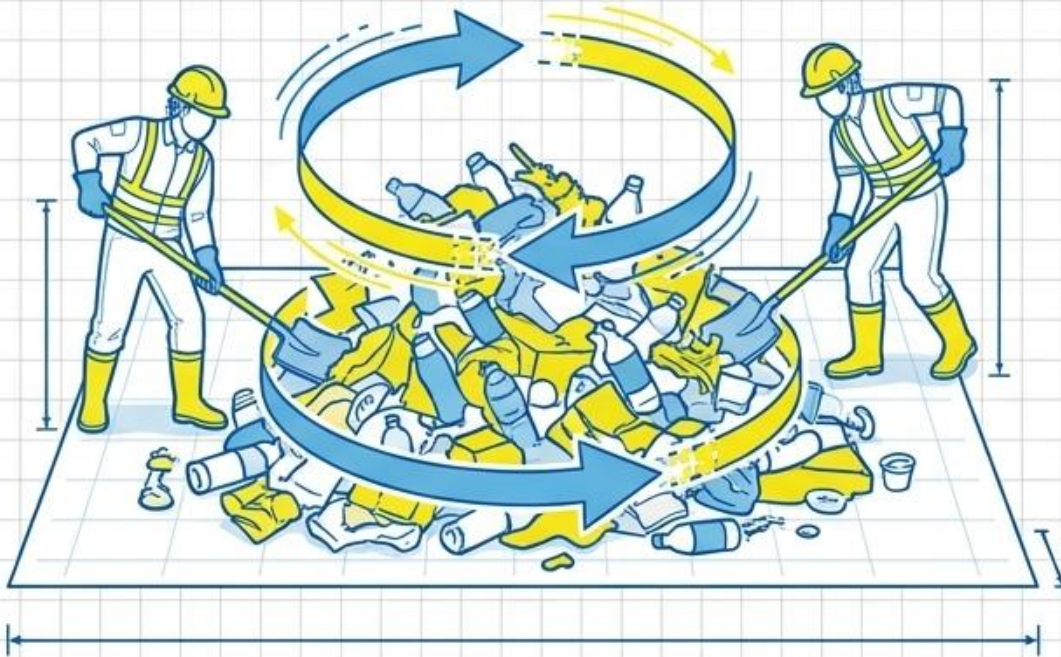
The Solution: The Quartering Technique.

The Quartering Technique: Mix and Flatten

Quartering is a scientific method for reducing the volume of a sample while maintaining its exact proportional composition.

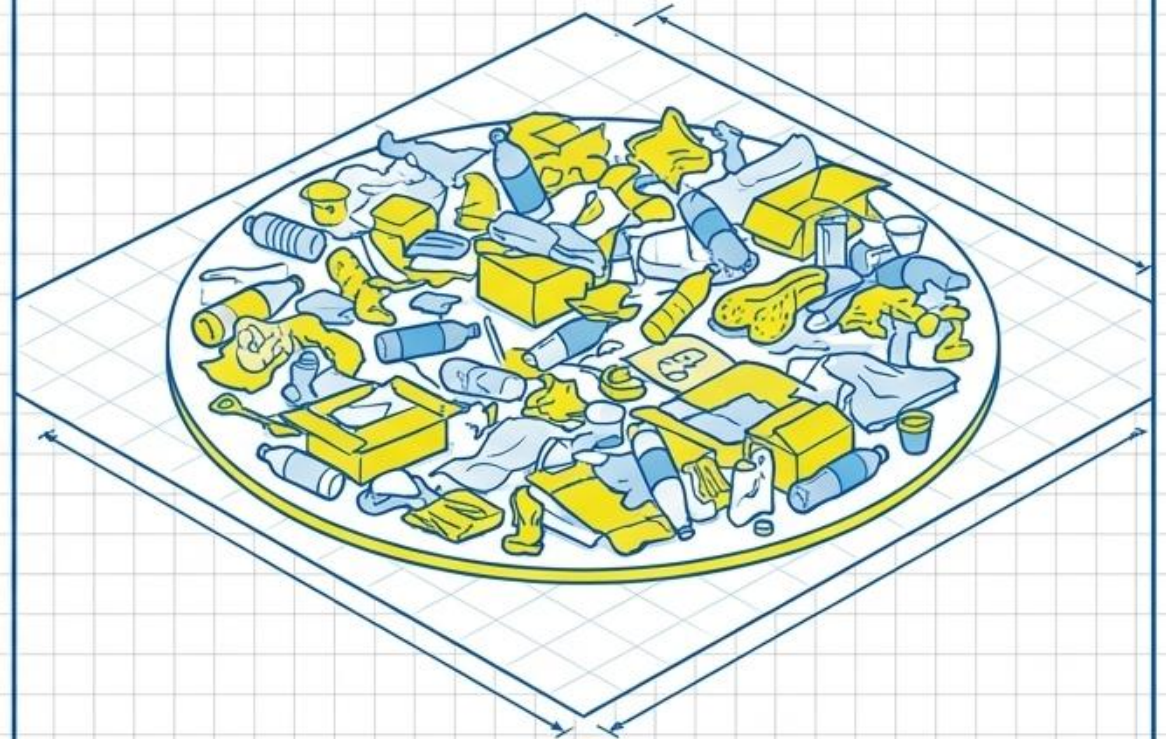
Step 1: Thoroughly Mix

Use shovels to aggressively turn and mix the 300 kg sample. The goal is to distribute all materials evenly throughout the pile.



Step 2: Flatten the Layer

Spread the mixed waste out across the tarpaulin until it forms a single, flat, and even circular layer.

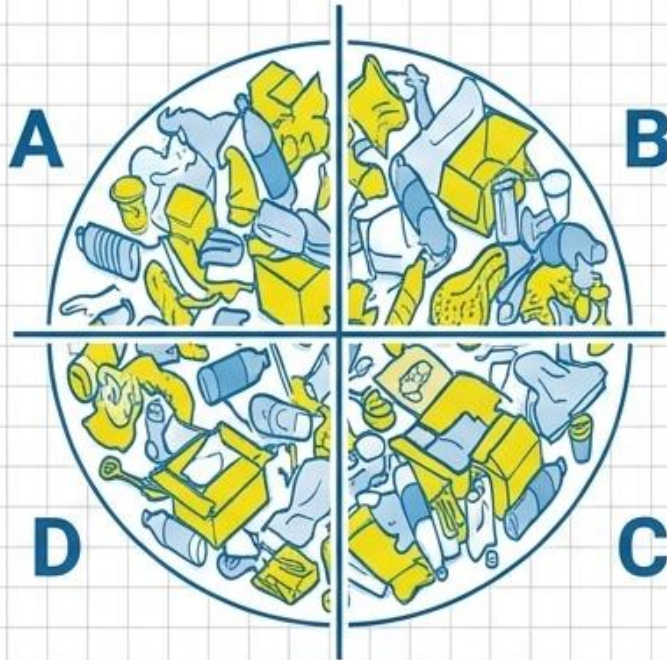


The Quartering Technique: Divide and Discard

Once the waste is flat and even, we systematically halve the volume.

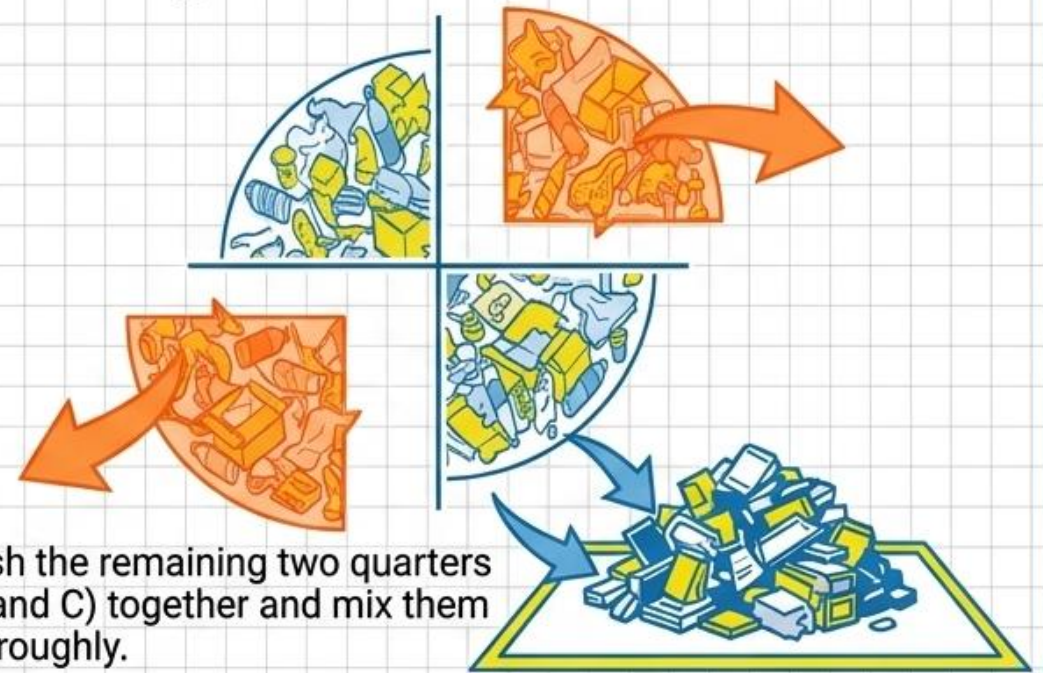
Step 3: Divide into Quarters

Visually split the flat layer of waste into four equal quadrants: A, B, C, and D.



Step 4: Discard and Repeat

Discard two opposing quarters completely (e.g., remove B and D from the tarp).

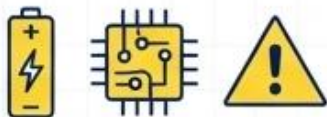


Repeat this entire process (Mix -> Flatten -> Divide -> Discard) until the remaining pile weighs between 50 and 70 kg.

Video

The 12 Sorting Categories

With the 50–70 kg target sample ready, deploy the 60L containers. Sort every piece of waste into one of these twelve strict categories.

1 Kitchen/canteen  Cooked/uncooked food, organic preparation waste	2 Garden/park  Non-food landscaping biodegradables	3 Paper & cardboard  Packaging and products	4 Plastics - film  Thin plastic bags/packaging
5 Plastics - dense  Hard plastic containers	6 Metals  Ferrous and non-ferrous	7 Glass  Bottles, jars, products	8 Textiles & shoes  Clothes, rugs, footwear
9 Wood  Processed and treated timber	10 Special wastes  E-waste, batteries, safe hazardous materials	11 Composite products  Multi-material items like Tetra Paks	12 Other  Inert items: soil, stones, rubber, nappies

A green recycling bin with a digital scale hanging from its handle. The bin is filled with various plastic bottles and containers. The scale's display shows '880g'. The bin has '60L' printed on its side.

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Survey Area:

Categories	Grouped/line conductors			Cost (R\$)	Average (R\$)
	Transmission coefficient 1 Dg	Transmission coefficient x 1 Dg	Transmission average x 1 Dg		
Voten					

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Closing the Loop: From Data to Action

The meticulous data gathered on these recording sheets does not just sit in a file.

- ✓ By categorizing and weighing this 50 kg sample, you provide your city with the exact intelligence required to:
 - ✓ • Identify critical infrastructure gaps.
 - ✓ • Calculate potential recycling rates.
 - ✓ • Attract investment for formal recovery facilities.
 - ✓ • Track progress against the UN Sustainable Development Goals (SDG 11.6.1).

Data is the first step toward a Waste Wise City.

