

THE RECYCLING LAB

School Waste

Management Toolkit

Tackling recycling contamination in Tower Hamlets schools

For primary and secondary schools | Tower Hamlets, London

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About This Toolkit

Schools in Tower Hamlets generate large amounts of waste each year. When the wrong items go into the wrong bin – known as contamination – recyclable materials can be rejected and sent for disposal instead of being recycled. This wastes resources, increases costs and undermines the efforts of pupils, staff and families who are trying to recycle correctly.

This toolkit gives teachers and pupils practical activities to explore what is currently happening in their school, identify changes that could make a difference, and create a clear plan for action.

This toolkit has been created as part of The Recycling Lab, a Creative STEM schools programme with UCL, supporting secondary and primary schools to develop climate solutions for Tower Hamlets.

UCL students created a phone-based game called RacoonR, designed specifically for Tower Hamlets.

As part of The Recycling Lab, local secondary school students also created mini-games to feature in RacoonR. You can find RacoonR here: [add link].

You can use RacoonR and the mini-games with pupils as a short starter activity, a discussion prompt or an extension task. The games introduce key themes around recycling contamination and encourage pupils to think about how local residents can make better recycling choices.

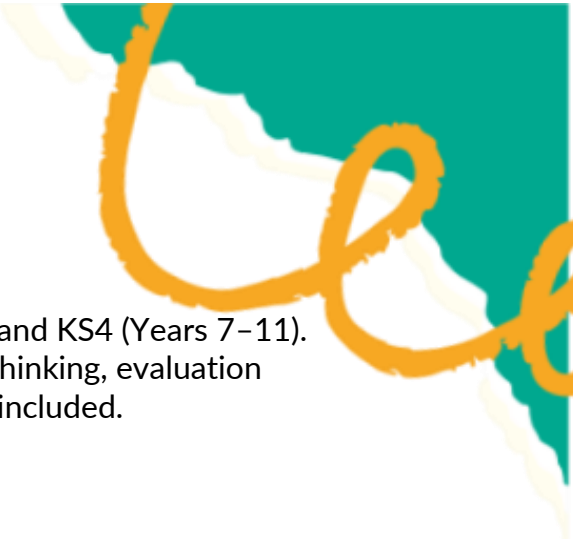


How to Use This Toolkit

1. Read Part 1 together – understand the challenge and why it matters in Tower Hamlets.
2. Complete the audit – use the activities in Parts 2 or 3 to find out what is happening now.
3. Explore solutions – help pupils generate practical ideas for change.
4. Build your action plan – turn ideas into clear, timed actions.
5. Use the reference section – Part 4 gives quick guidance on common problems and fixes.

Who Is This Toolkit For

Primary schools: Activities are designed mainly for KS2 (Years 3–6), with options to simplify for KS1 through more teacher modelling, pictures and whole-class discussion. Teacher facilitation notes are included in each activity.



Secondary schools: Activities are designed mainly for KS3 and KS4 (Years 7–11). They are more analytical, with data collection, root-cause thinking, evaluation matrices and SMART action planning. Curriculum links are included.

An Exercise Note

- These activities are designed to be flexible. Teachers should adapt the language, pace, level of support and recording methods to suit their pupils, year group and school context.
- Our approach with Recycling Lab was to embed these exercises in a games framework - and we recommend using the mini-games from RacoonR as an introduction tool for classes to playthrough and spark initial interest.
- The mini-games are listed in the index at the end of this toolkit.

PART 1 | Why It Matters

The Tower Hamlets Challenge

Tower Hamlets is one of the most densely populated boroughs in England with over 330,000 residents, and faces particular challenges around recycling, including shared bins, high numbers of flats and busy public spaces. In 2022/23, Tower Hamlets recorded a household recycling rate of around 17.7%, among the lowest in England.

A key challenge for the borough is recycling contamination.

Contamination happens when the wrong materials end up in the wrong bins. In schools, this might mean food scraps in recycling, crisp packets in mixed recycling, or recyclable items placed inside black bags. Even a small amount of contamination can cause an entire bin's contents to be rejected by recycling facilities.

Tower Hamlets Video

Tower Hamlets Council created this short animation to show what happens to recycling after it is collected — from the doorstep or bin store to the creation of new items from old materials.



Link:

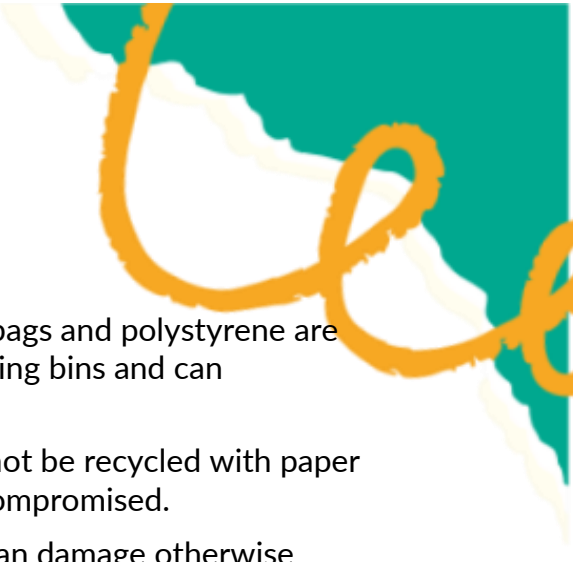
<https://www.youtube.com/watch?v=94spnCQDN9o>

What is Contamination?

Wrong bin: Recyclable items are placed in the general waste bin, or non-recyclable items are placed in the recycling bin.

Food residue: Items go into recycling with food still inside — for example, a yoghurt pot with yoghurt left in it or a greasy pizza box.

Black bags: Recycling is placed inside black bags. In Tower Hamlets, recycling should not be put in black sacks, as it will be treated as general rubbish.



Non-recyclable plastics: Plastic film, crisp packets, carrier bags and polystyrene are not currently accepted in Tower Hamlets household recycling bins and can contaminate recycling.

Paper towels: Used paper towels, tissues and napkins cannot be recycled with paper and cardboard. They are too short-fibre and hygienically compromised.

Liquids: Drinks or liquid waste poured into recycling bins can damage otherwise recyclable materials, especially paper and cardboard.

Why Schools Are So Important

Schools are powerful places for changing waste behaviours. Pupils influence what happens in school and can also share new habits and knowledge with families and communities. In a diverse and connected borough like Tower Hamlets, improvements in school recycling can support wider change.

The Waste Ripple

Just over nine million pupils attend more than 24,000 schools (including both primary and secondary schools) in the UK (GOV). It's estimated that each school pupil generates between 20 and 45kg of waste every academic year (WRAP). This means a minimum of 180 million kg of waste could be created by school pupils across the UK annually.

- UK schools are estimated to use over 1 million sheets of paper per year, with a significant portion going to waste.
- The education sector in the UK wastes around £250,000 of food waste per year.

Tower Hamlets' Climate Goals

Tower Hamlets Council has committed to being a net-zero borough. Schools that reduce contamination directly contribute to that goal by ensuring more materials are genuinely recycled rather than sent to energy-from-waste facilities.

Cost to Schools

When recycling is contaminated, waste contractors may charge penalty fees or reclassify the load as general waste – which costs more to dispose of. Clean recycling saves schools money that can be spent on education.

Pupil Wellbeing and Pride

Clean, well-labelled waste stations can support pupil pride, responsibility and ownership of the school environment, linking recycling to wider wellbeing, citizenship and school values.

PART 2 | Primary School Activities

The four activities below are designed mainly for KS2 pupils (Years 3–6). For younger pupils, run them as whole-class activities using pictures, verbal responses and adult support. Each activity includes a Teacher Guide followed by a pupil-facing activity.

Activity P1 – Our Waste Walk (Audit)

TEACHER GUIDE

Time: 45–60 minutes (including walk) **Group size:** Whole class or small groups

What you need: Clipboards, pencils, this sheet, access to school bins

Learning objective: Pupils will observe and record what types of waste are in school bins and identify examples of contamination.

How to run it: Introduce pupils as “Recycling Detectives”. Walk around the school with clipboards. At each bin point, pupils observe only – they must not touch or move any waste – and record what they can see. Back in class, discuss what they found.

Ask: Was anything in the wrong bin? What surprised you?

Student Activity: Our Waste Walk

Teacher tip: Give each group a mission, such as “spot the best bin station” or “find one confusing bin sign”. This makes the audit feel more game-like and keeps pupils focused. Do NOT touch the bins – just look!

Back in Class – Talk About It

- What was the most common type of waste you saw?
- Did you spot anything that was in the wrong bin?
- Was there anywhere that had no recycling bin?
- What one change would make the biggest difference?



Bin location	Type of bin (recycling / food / general)	What can you see inside?	Anything in the wrong bin? ✓/X

Our most important finding was:

Activity P2 – Sorting Challenge: What Goes Where?

TEACHER GUIDE

Time: 30 minutes **Group size:** Pairs or small groups

What you need: A set of waste item cards (or draw them), three labelled areas:
General Waste / Recycling / Food Waste

Learning objective: Pupils can correctly sort common school waste items and explain why each goes where it goes.

How to run it: Give groups a set of waste item cards. Ask them to sort the cards into three categories. Reveal the correct answers, then discuss any surprises. To make it more game-like, give one point for each correct answer and one bonus point for a clear explanation.

Student Activity: QUIZ: Where Does It Go?

Look at each item below. Write which bin it goes in, then explain why in the last column. This can be done with picture cards, real clean examples, or images on the board.

Item	Correct Bin	Why does it go there?
Plastic drinks bottle (rinsed)	Recycling	
Banana peel	Food waste	
Scrunched up paper towel	General waste	
Empty tin can (rinsed)	Recycling	
Crisp packet	General waste	
Clean cardboard box (flattened)	Recycling	
Pizza box with grease on it	General waste	
Apple core	Food waste	
Juice carton (rinsed)	Recycling	
Cling film / plastic wrap	General waste	

The item that surprised our group the most was:

Activity P3 – What Could We Change?

TEACHER GUIDE

Time: 30–45 minutes **Group size:** Groups of 4–6

Learning objective: Pupils will identify at least three changes that could reduce contamination in their school.

How to run it: Share findings from Activity P1. Ask each group to brainstorm ideas using the prompts below. Groups share back, then the class votes on the top three ideas to take forward.

Student Activity: Our Ideas for Change

Think about what you found in Activity P1. Now think about what could make recycling better in your school. Use the prompts to help you!

Prompt Questions

- Could we add more bins, or move bins to better places?
- Could we make bins easier to understand, using clearer signs, colours or pictures?
- Could we remind people more often through posters, announcements or class talks?
- Could pupils take on a special role, such as Waste Champion or Eco Monitor?
- Could we agree a simple school rule, such as “recycling goes loose – no black bags”?

Our Ideas

#	Our idea	Easy or hard to do?
1		
2		
3		
4		
5		
6		

After our class vote, our top idea was:

Activity P4 – Our Recycling Promise & Plan

TEACHER GUIDE

Time: 30 minutes **Group size:** Whole class

Learning objective: Pupils commit to specific actions and understand who is responsible for each step.

How to run it: As a class, agree the top three changes from P3. Assign each change to a class champion or small team. Complete the plan together and display it in the classroom or corridor. Revisit it after the review date.

Student Activity: Our Class Recycling Declaration

We, Class _____, promise to help make our school better at recycling.

We will make these changes:

1. _____

2. _____

3. _____

Our class Waste Champions are: _____

We will check how we are doing on: _____ (date)

Signed by our class: _____

Our Simple Action Plan (to share with SLT)

What we will do	Who will do it	By when	Done ? ✓

PART 3 | Secondary School Activities

The four activities below are designed mainly for KS3 and KS4 students (Years 7–11). They are more analytical and data-focused, while still being adaptable for different groups. They connect to Geography, Science, PSHE, Maths and English. Each activity includes a teacher facilitation guide.

Curriculum Links

GCSE Geography: Resource management, sustainability, population pressure and local environmental action

KS3/GCSE Science: Materials, environmental chemistry, life-cycle thinking and human impacts on ecosystems

PSHE: Community responsibility, environmental citizenship and collective action

Maths: Data collection, percentages, estimating, averages and graphing (Activity S1)

English: Persuasive writing, report writing and presenting recommendations (Activity S4)

Activity S1 – School Waste Audit: Data Collection & Analysis

TEACHER GUIDE

Time: 60–90 minutes (1–2 lessons) **Group size:** Groups of 3–4

What you need: Clipboards, tally sheets, camera/phone for photos if permitted, graph paper or spreadsheet software

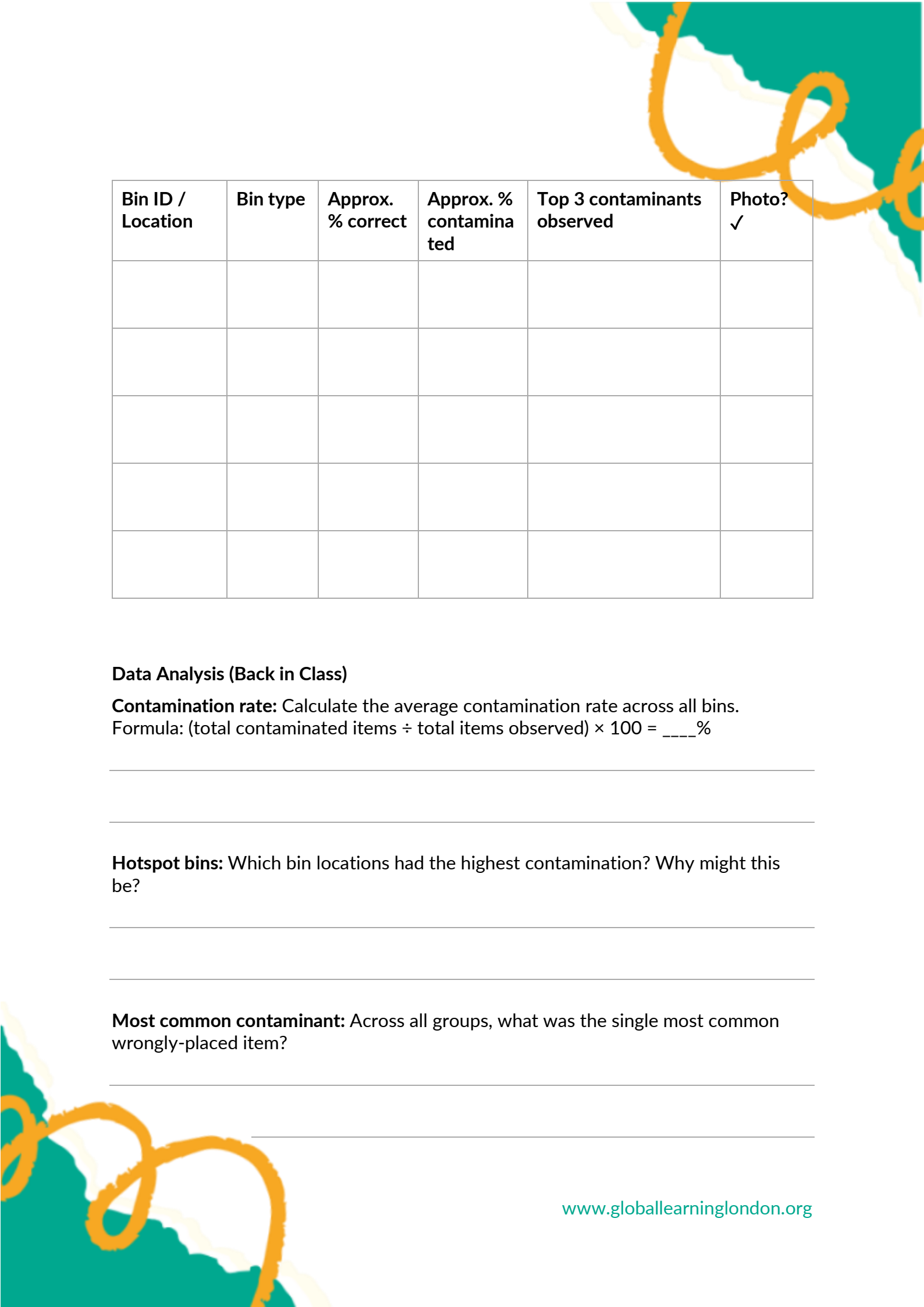
Learning objectives: Students will collect systematic primary data on school waste streams, identify contamination rates and present findings graphically.

How to run it: Assign each group two or three bin locations. Students use the audit sheet to record observations without touching waste. Back in class, pool data, calculate percentages and create graphs. Groups present key findings and discuss patterns and possible causes.

Teacher tip: Agree photo permissions before the audit. Photos should show bins and signage only, not identifiable pupils.

Student Activity: Systematic Waste Audit

Use this sheet to record your observations at each bin location. Estimate proportions visually – you do not need to weigh or touch the waste.



Bin ID / Location	Bin type	Approx. % correct	Approx. % contaminated	Top 3 contaminants observed	Photo? ✓

Data Analysis (Back in Class)

Contamination rate: Calculate the average contamination rate across all bins.

Formula: (total contaminated items ÷ total items observed) × 100 = ____%

Hotspot bins: Which bin locations had the highest contamination? Why might this be?

Most common contaminant: Across all groups, what was the single most common wrongly-placed item?



Pattern by location: Is contamination worse in classrooms, corridors, the canteen, or elsewhere? What does this tell us?

Who has the power to reduce contamination in school – pupils, teachers, catering staff, site staff, school leaders or waste contractors?

Create a bar chart or pie chart of your data using graph paper or a spreadsheet. Label it clearly and include it in your findings presentation.

Activity S2 – Root Cause Analysis: Why Does Contamination Happen?

TEACHER GUIDE

Time: 45 minutes **Group size:** Groups of 4–5

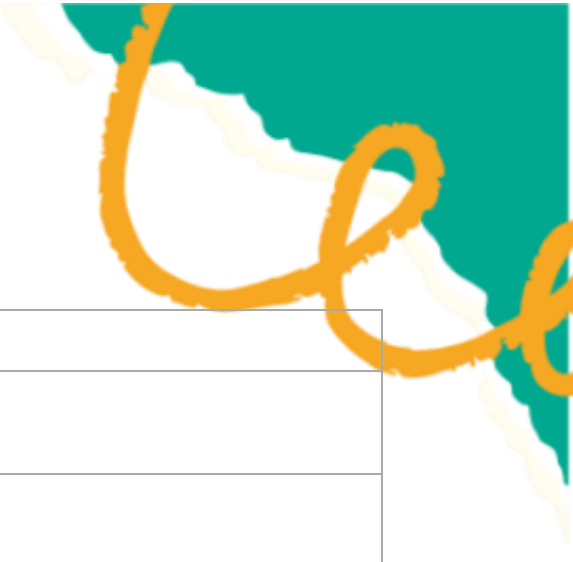
Learning objective: Students apply root-cause thinking (the 5 Whys technique) to identify the underlying reasons for contamination problems.

How to run it: Each group takes one finding from S1. They apply the 5 Whys technique – asking “Why?” repeatedly to drill down to the root cause. Groups share back and discuss whether causes are physical (bins), behavioural (habits), systemic (policy or culture).

Student Activity: The 5 Whys – Getting to the Root Cause

Choose one contamination problem from Activity S1. Then ask “Why?” five times to find the root cause.

The contamination problem we chose:



Step	Question	Our answer
Why #1	Why does this happen?	
Why #2	Why does this happen?	
Why #3	Why does this happen?	
Why #4	Why does this happen?	
Why #5	Why does this happen?	

Root cause (the deepest "Why"): This happens because...

Cause Category

Which best describes the root cause? Note which applies — a problem may fit more than one category.

- Physical — bin locations, signage, bin types, access
- Behavioural — habits, awareness, knowledge, motivation
- Systemic / policy — school rules, staff culture or no whole-school waste policy in place
- Resource — budget, time, staffing, contractor limitations

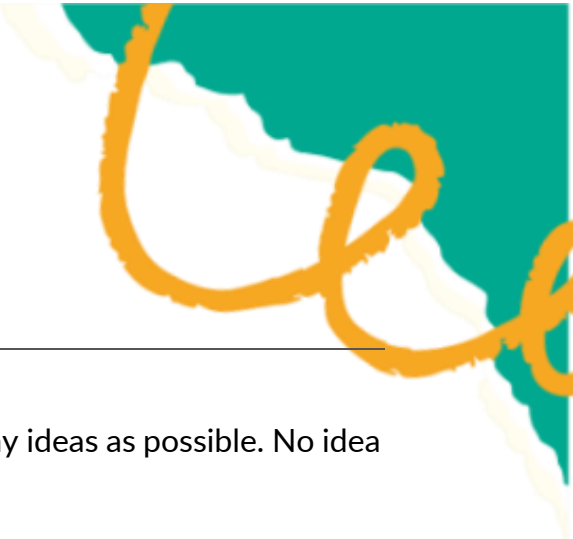
Activity S3 — Solutions Workshop: Generating & Evaluating Ideas

TEACHER GUIDE

Time: 60 minutes **Group size:** Groups of 4–5

Learning objective: Students will generate potential solutions, evaluate them against criteria (impact, cost, ease and speed), and shortlist the strongest ideas for an action plan.

How to run it: Use root causes from S2. Groups brainstorm solutions using the starter prompts below. Each idea is rated on the evaluation matrix. Groups present their top two ideas. The class agrees on three to five ideas to carry into Activity S4.



Student Activity: Generating Solutions

Using your root causes from Activity S2, brainstorm as many ideas as possible. No idea is too small or too ambitious at this stage.

Solution Starter Prompts

Infrastructure: Add more bins, move bins to better locations, pair bins (general waste + recycling), introduce food waste caddies where appropriate, and improve bin signage and labels.

Education: Classroom waste lessons, school assembly presentations, peer-to-peer education, form tutor guidance notes, staff training session.

Behaviour change: Student Waste Champions, class competitions or league tables, rewards for correct sorting, daily reminders and lunchtime monitors.

Policy & systems: Whole-school waste policy, links to school values, contractor review, governor or leadership commitment, and links to Eco-Schools Award or other sustainability work.

Solution Evaluation Matrix

Rate each idea 1–5 for each criterion. 1 = very low/difficult; 5 = very high/easy. Higher total = stronger idea.

Idea / Solution	Impact on contamination (1–5)	Cost to implement (5=low cost)	Ease of implementation (1–5)	Speed of impact (5=fast)	TOTAL (/20)

Our top 2 ideas to take to the action plan:

Activity S4 – Action Plan: Making It Happen

TEACHER GUIDE

Time: 45–60 minutes **Group size:** Whole class or working groups

Learning objective: Students will produce a SMART action plan that could be presented to senior leaders, governors or an Eco Committee.

How to run it: Introduce SMART goals. The class agrees on the top three to five ideas from S3. Complete the action plan table, identify a student lead for each action and set a review date. Consider asking students to present the plan to the headteacher, Eco Committee or governors.

Student Activity: Our School Waste Action Plan

SMART Goal Framework

S – Specific: Exactly what will be done.

M – Measurable: How will you know it is working? (e.g. contamination rate drops by X%)

A – Achievable: Is it realistic given your resources and time?

R – Relevant: Does it address the root cause you identified?

T – Time-bound: When will it be done? When will you review?

Action Plan Table

Action	Who is responsible?	Resources needed	Target date	Done ? ✓

Monitoring & Evaluation

Review date (half-term)	
Review date (end of term)	
Student lead(s)	
Staff sponsor	
How will we measure success? (e.g. repeat audit, contamination %, survey)	

Consider presenting this plan to your school's Eco Committee, Senior Leadership Team or governors. Real plans drive real change!

PART 4 | Common Challenges & Solutions (Reference)

Use this reference section at any point. It maps common contamination problems found in school settings to likely root causes and practical solutions for Tower Hamlets schools.

Challenge	Why it Happens	Solution
Food waste in mixed recycling bins	No dedicated food waste bin nearby; pupils are unsure what to do with leftovers.	Place a clearly labelled food waste caddy near eating areas where your school has food-waste collection. Introduce lunchtime Waste Champions to help peers sort correctly.
Black bags placed inside recycling bins	Students and staff assume waste in a bag is contained and acceptable.	Keep black bags away from recycling points. Use clear or colour-coded bags if bags are needed. Add signage: "Recycling goes loose – no black bags."
Crisp packets, wrappers and foil-lined packaging in recycling	Packaging looks like plastic, so people assume it can be recycled.	Post a "What Can I Recycle?" poster at each bin point. Run a quick activity comparing flexible packaging with rigid plastic bottles, pots, tubs and trays.
Paper towels in paper recycling	Both are paper – the distinction is not obvious.	Label bins clearly: Paper recycling – NO paper towels, tissues or napkins. Consider hand dryers to reduce paper towel use.
Recyclables placed in general waste bin	Recycling bins not visible or accessible near the point of disposal.	Audit bin placement – ensure every general waste bin has a recycling bin alongside it. Introduce a Bin Buddy pairing system.



Challenge	Why it Happens	Solution
Cartons and bottles not emptied or rinsed	Students don't know rinsing is needed; no convenient sink nearby	Add "empty and rinse" reminders to signage. In canteens, add a simple emptying/rinsing point if practical.
Contamination varies by class or year group	Inconsistent teaching of waste sorting; different staff expectations.	Introduce a whole-school waste policy. Include waste education in PSHE, Science or Geography. Use this toolkit to standardise the approach.
Confusion about what is recyclable in Tower Hamlets	National recycling messages can differ from local rules. Staff may be unsure what to teach.	Download the Tower Hamlets What Can I Recycle? guide and display it in every classroom. Brief all staff at the start of each term.
Newly implemented changes not sustained	Initial enthusiasm fades; no monitoring system in place.	Assign a Student Waste Champion each term. Conduct a repeat audit each half-term and share results on notice boards.
Catering/kitchen waste contaminating recycling	Kitchen staff not included in waste training; different streams in the kitchen.	Include kitchen and catering staff in all waste management training. Run a separate kitchen waste audit with dedicated streams for food waste, cardboard, glass, and general waste.

What Can Be Recycled in Tower Hamlets Schools?

Always check Tower Hamlets Council's latest guidance before printing or displaying this section.

YES — Recyclable	NO — Not Recyclable Here
• Clean paper and cardboard • Plastic bottles (rinsed) • Glass bottles and jars (rinsed) • Metal tins and cans (rinsed) • Plastic pots, tubs and trays (rinsed) • Cartons (Tetra Pak, rinsed) • Newspapers and magazines	• Crisp packets and sweet wrappers • Plastic film and carrier bags • Polystyrene • Paper towels, tissues, napkins • Foil trays with food residue • Black plastic packaging • Items inside black bin bags

INDEX

Below is a list of the mini-games created by secondary school students in Tower Hamlets.

Add the live link for each game below so teachers can open them on a desktop, tablet or phone where school policy allows.

Clean Sweep: A driving/adventure game where you control Ricky the Racoon, enter boss zones and defeat Trash Titans to clean up Tower Hamlets. (Oaklands)

Racoon Runner: A fast-paced runner where you dodge bins and trucks, collect recyclables for points and survive an angry human chasing you. (Oaklands)

Racoon Scavenger: A 2D platformer scavenger hunt. Travel through levels, collect recyclables, avoid humans, sort items into the correct bins and clear the level. (Oaklands)

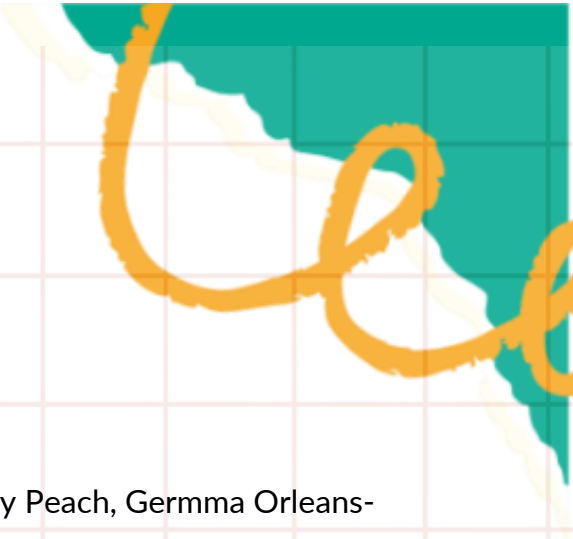
Racoon Racing: A racing game with collectible waste, nitro pickups and customisable skins. Answer recycling questions at each checkpoint, avoid hazards and sort collected items at the end of the race. (Swanlea)

Recycle Jump: An infinite vertical climber where you jump between moving platforms, manage wind hazards and collect power-ups. Try to reach the highest altitude and achieve your best score. (Swanlea)

Recycle Raiders: Sort falling items, let recyclables go into the bin and destroy non-recyclables with your laser. Watch out for Trash Zombie bosses that test your speed and accuracy. (Swanlea)

Recycle Rush: Run through the level, collect recyclables against the timer, hit checkpoints and avoid enemies. At the end, sort your recyclables into the correct bins to earn a recycling bonus. (Swanlea)

Waste-Man Odyssey: A side-scrolling platformer where you navigate changing worlds filled with enemies, obstacles, collectables and power-ups. Customise your character by collecting recyclables and clearing levels. (Swanlea)



Acknowledgments

The Team

This project was created by Global Learning London.

The Recycling Lab team: Fatema Zehra, Faaria Ahmad, Toby Peach, Germma Orleans-Thompson, Maryam Shaharuddin, and Jess McKenna.

Additionally, thank you to the Computer Science team at University College London who helped bring this vision to life.

This toolkit was created by Toby Peach.

The Funders

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The Schools

Thank you to the enthusiasm and commitment from Year 10 and 12 students at Oaklands and Swanlea who took part in this programme. Thank you also to the teachers who supported making this happen – Ifthaque Ahmad and Rahima Ali.



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