



Bin Materials Audit

Australian Science and Mathematics School

21st February 2018

Currently **175 Litres** per day are going to landfill for 430 amount of people*

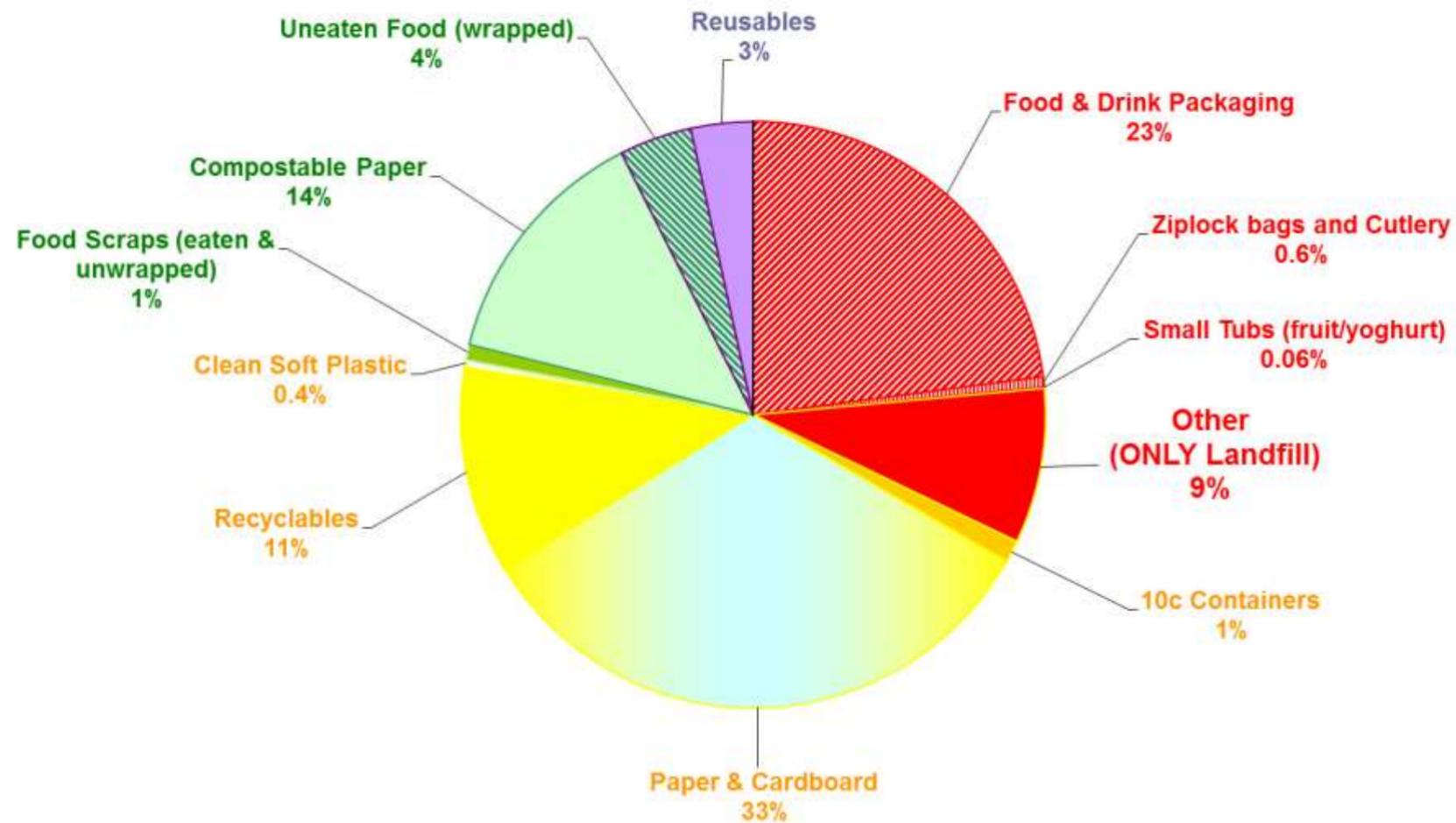
This is equivalent to **0.407 Litres** per person per day.

HOWEVER – only **15 Litres** HAS to go to landfill. By **reducing, reusing** and **recycling** Australian Science and Mathematics School **could reduce their waste to landfill by 91%**.

**Note: there were no lessons after lunch on the collection day, which may have reduced the overall volume of material*

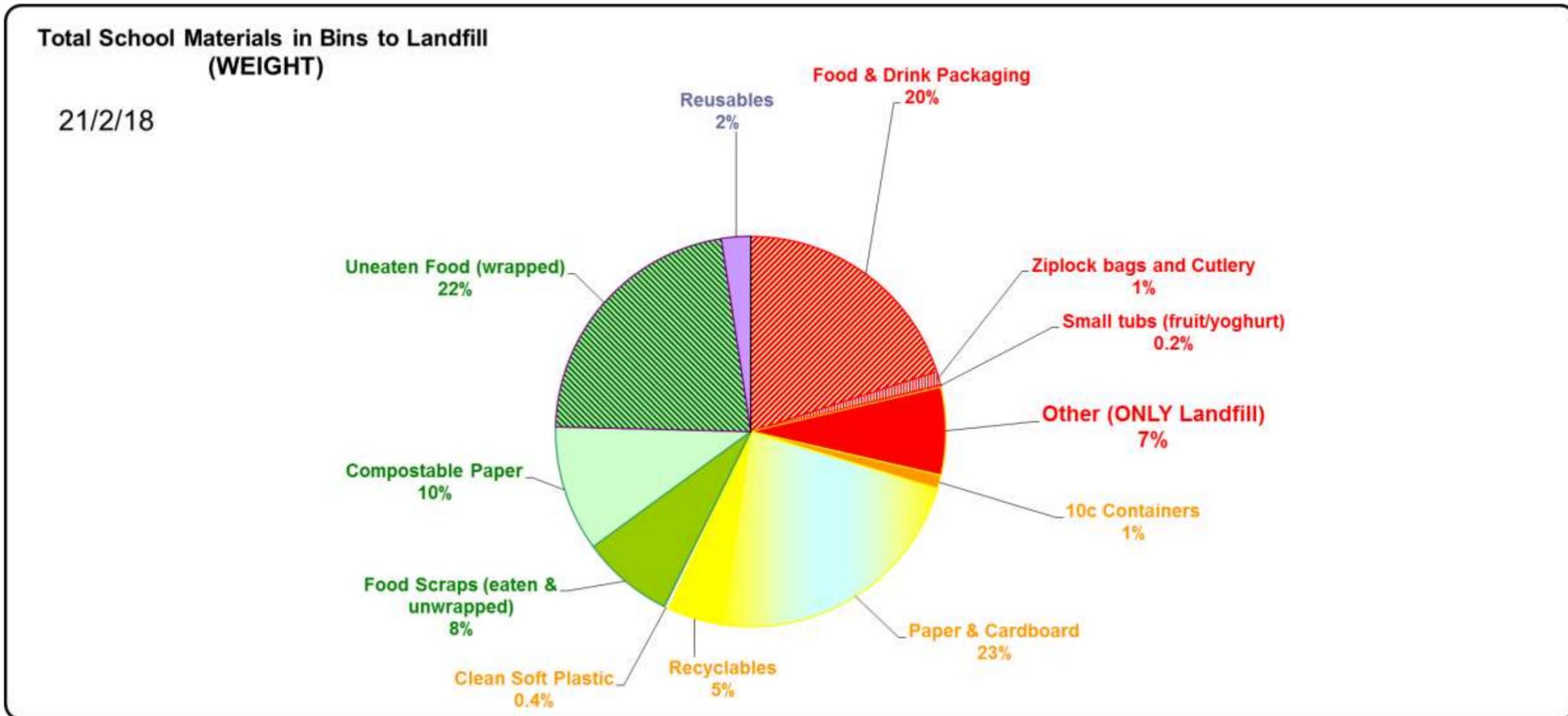
Total School Materials in Bins to Landfill (VOLUME)

21/2/18



During a KESAB audit, the materials are measured by volume and weight. Often information relating to landfill, recycling and resource recovery is reported by weight, as this is how we pay for landfill in metropolitan areas. We believe that volume is a more useful measure for education sites as this determines how many bins are required and also how much space in the landfill the materials will take up. Throughout this report, the volume measure is more prominent; however the weight is referred to in a few cases. The raw data and excel tables and charts have also been sent to your site. These can be used for additional classroom learning opportunities, such as a comparison and discussion around units of measurement and specifically the weight and volume.

The table below indicates the materials found in bins, by WEIGHT. While we don't **CURRENTLY** consider this to be as useful a unit of measurement for sites (**this may change as the increased landfill levy may affect the way sites are charged for collections**). Comparing heavy items (e.g. food scraps) with their equivalent volume can be particularly dramatic! This may then prompt the question: which unit of measurement provides us with the most useful information? This is a very important factor in developing experiments and surveys. This could also be applied to information about recycling (e.g. some councils have high recycling rates- by weight- as they may generate more glass items than other areas which may have a higher volume due to more plastics and cardboard). For follow-up activities, see the [WOW website](#). You could do weight vs volume recycling activities as homework or between classes or areas of your site.



Recyclable Materials - 80 L, 3 kg per day, 46% of the total volume of materials to landfill

80 Litres of recyclable materials could be recovered from the landfill bins. Recyclable materials are things that could be reprocessed and turned into products again, instead of going to landfill.



Paper/Cardboard

57 L per day which makes up **33%** of the total volume of materials in the landfill bins.



10c Containers

7 containers per day = **\$0.70/day**. In a year you could raise **\$170**.



Clean Soft Plastic

This mostly comes from libraries, canteens and offices. **1 L** was found in the landfill bins.



Recyclables

are commonly found in OSHC, school canteens, home economics areas, and staff rooms where there is access to water for rinsing. **20 L** which makes up **11%** of the total volume of materials in the landfill bins.



Electrical Materials

This is a growing global issue. Electrical materials should be disposed of correctly and safely.

Compostable Materials - 33 L, 4 kg per day, 19% of the total volume of materials to landfill

33 Litres and 40% of the total weight were potentially compostable items and could be recovered from landfill bins. Compostable items are things that once grew and can be returned to the earth as compost to help more things grow. The type of composting system and ability to compost on site will depend on the size of your site and conditions specific to your area.

Food Scraps



1.5 L of the landfill bins were food scraps - **1%** of the total volume of materials in landfill bins. However, food scraps are some of the heaviest landfill items, weighing in at **1 kg - 8%** of total weight.

Compostable Paper



This consists of paper towel, tissues and paper bags. **24 L per day = 14%** of total volume.

Uneaten Food



7 L, 2 kg was in the landfill bins, often still wrapped or in a packet. This was **4%** of the total volume of landfill bins. Ideally this would be significantly reduced.

Recycling

Paper/Cardboard recycling: 33% is above the average (20%) for paper/card found in landfill bins; with about 11 400 L (48x 240L wheelie bins) paper/card are going to landfill rather than being recycled each year. Regular reminders to both staff and students and signs on all the paper/card bins (or posters on the walls above) should help reduce this.

10c Containers: 7 containers were found in landfill bins rather than the designated 10c bins. These were all cartons (milk/juice), so it may be some students are not aware these containers are worth 10c.

While these were not audited, from observations the 10c bins were highly contaminated, mostly with other recyclable material. Consider changing the signage on these bins to clearly state **10c drink containers only**, and changing the lid colour (perhaps orange or white). It may help to have pictures on the top of the bins as well as the front, as these are covered by the bin liners. See the [WOW website](#) for some examples.

Clean Soft Plastic: Based on the audit day results, this is **200 L/yr**. This can be collected to take to local supermarket collections (currently) to be made into recycled plastic furniture and boardwalks- a better option than sending plastic to landfill.

Recyclables: Currently, co-mingled recyclables are (mostly) being placed into general waste bins, to be sorted at by SUEZ. However, as stated above, many are ending up in the 10c bins instead. It may be worth getting a separate recycling bin (yellow) for recyclables, which will better replicate home recycling systems and should reduce contamination. It will also mean you already have systems established if the waste contractor at Flinders University changes.

Electrical Materials: **Electrical items** (anything with a battery or cord) and **Fluoro tubes** are banned from landfill and **MUST NOT go into school skips or bins**. For more information on e-materials disposal see the [EPA website](#). **Fines from \$300 to \$30 000 can apply for inappropriate disposal.**

Composting

Food Scraps: 1% is well below the average figure of 8%. This is 7.5 L/week and 5 kg/week, with about 60 L/week and 20.5 kg/week going to organic bins. This is excellent, however may be a reflection of only half a day of classes onsite. There was some contamination in the organics bins (about 13% by volume). This consisted of packaging, a plastic plate with paint, and wrapped uneaten food. Ensure students understand that no plastics can go into the organics bin.

Compostable Paper: 14% is above the average 13% for high schools. This is 120 L/week, with about 45 L/day (225L/week) going separately to organics bins. It's great to see hand-towel from toilets going into green bags for organics! Consider a similar bin in the laboratories, as this is where most of the compostable paper in landfill bins came from. It may also be worth having a sign on handtowel dispensers asking users to limit how many sheets they take (e.g. Figure 1). There was also a compostable bag of shredded paper, which could have gone to paper/card recycling instead.

The combined volume of food scraps and compostable paper per week- is 107.5 L/week and about 6 kg/week. If the separated organic material is included in this, it would be about **393 L/week (34 kg/week)** which could easily fit into a 660L organics skip. Commercial collections are approx. \$10-15/240L bin collection and around \$25-30/660L skip- which could be collected once a week, if ASMS even decided to manage waste separately from the University.

Uneaten Food: 4% is below the average of 5%*. This included the equivalent of 6 apples, a banana, 3 sandwiches, ½ a loaf of bread, a bag of almonds & grapes and an Up 'n Go.

Over a year, this is about \$2 700 wasted on uneaten food.

Aim to reduce this by having discussions with students about the consequences of food waste (e.g. methane emissions in landfill, negative externalities in water use, etc.). See the [ABC](#) and [Cool Australia](#) webpages for some activity ideas.



Reusable Materials – 6 L, 0 kg, 3% of the total volume of materials to landfill

Reusables are items that could be used again before disposal, and are often things that shouldn't have ended up in the landfill bins to start with!

6 L of reusable items were found in the audit.

This included:

Packing bubble plastic, crafts, wood and pens



Reusing

Reusables: The items that were found could be easily reused by having a communal storage area, where reusable items can be placed and shared amongst staff/students. This can have cost savings for the school in the materials purchased - for example, saving pencils and sharpening them means less need to be purchased each year.

Single-sided Paper: Because paper is a big budget item for education sites, it is important to try and use both sides of suitable paper before recycling to make the most of this valuable resource. It is also a good idea to **set printing settings to print double-sided as default.**

Reducable Materials - 56 L, 3 kg, 26% of the total volume of materials to landfill

Items in the 'Reducing' Category currently have no easy way to be managed in a school environment. Many of the things such as food and drink packaging can be avoided or sent back home to reduce the amount of materials going to landfill from your site.

This also includes the category of 'other' – in an ideal situation, 'other' is the **ONLY material that would be going to landfill.**



Food and Drink Packaging

41 L per day = 8 240 L a year or 34 wheelie bins. It is **23% of the total volume of materials in landfill bins.**

As these items can't be recycled, reducing their use is the best option!



Ziplock Bags & Cutlery

18 ziplock bags per day were found. This equates to **3 600/yr**, or around **\$180** of ziplock bags each year!

There were **9 pieces** of disposable **cutlery= 1 800/ year.**



Small Tubs and suckers

There were **2 tubs** in the landfill bins. This equates to **400 tubs/year.**



Other

Only **15L** of material could not be reduced, reused, recycled or composted was sent to landfill.

This is just 9% of what is currently going to landfill.

Reducing

Food and Drink Packaging, Ziplock Bags & Cutlery, Small Tubs:

23% of your landfill bins were food and drink packaging, which is the average for secondary schools in SA.

Most of the materials to be reduced come from families purchasing decisions and we suggest sharing audit results with families. Newsletter articles, or new student information packs could be a way to inform families about ASMS's sustainability commitment, and provide some alternative options to packaging (e.g. beeswax wraps, reusable containers). Consider making beeswax wraps in class so students have their own (a much cheaper option than purchasing them).

We strongly recommend watching the ABC documentary series the [War on Waste](#) in classes, and looking at the resources on the [War on Waste Focus](#) website. There is even a [study guide](#) (with lesson plans and activities for Secondary students).

Other: In an ideal situation where items are reduced, reused, recycled or composted there is very little material that **MUST** go to landfill. This is a long term goal to aim for which can provide a range of contextual learning opportunities and cost savings for the site. You could easily become a Zero Waste Bin free school within the next 2 years!

Currently, the equivalent of 146 wheelie bins (240L/bin) a year are going to landfill. However, with 'ideal' collection and avoidance systems in place, the total daily volume of material to landfill for the entire school could be around

15 L per day = 750 L per term = 3000 L per year – or just 13 wheelie bins per year!



This is a great long term goal to strive for, and some sites have reduced their material to landfill by more than half after conducting a bin audit.

This can also deliver significant cost savings for the school and is worth discussing with finance staff.



Your site compared to State Average

When comparing between sites, a per person per day (pppd) measure is used. This allows a degree of normalisation for sites of differing sizes.
A brief comparison is shown in the table below - see the data sheets for more detailed data.

	ASMS 2018	Average of Secondary SA Sites (n=36)
Recyclables stream	0.19	0.33
Compostables stream	0.08	0.22
Reusables stream	0.01	0.04
Landfill stream	0.13	0.24
Total Material Audited	0.41	0.82

Australian Science and Mathematics School is **below** the state average, based on a per person measure of total materials audited. This amount could be further reduced by following some of the recommendations made for resource recovery and waste reduction.

Please ensure that your site makes/maintains contact with the council Waste/Sustainability Education Officer and NRM Education staff, particularly if you are a Sustainable School site, as they can support you with engaging staff, linking to a School Environmental Management Plan- SEMP. You can find contact information on the [NRM Education website](#).

For more information, questions or queries please contact:

Ali Roush- ali@kesab.asn.au

Phone: 8234 7255
Fax: 8234 7266

Kevin Spoehr- Kevin.Spoehr@sa.gov.au

Phone: 8226 1703

Summary of Recommendations

Recycling - 46% of the total volume

Paper/cardboard: While there are paper/cardboard recycling bins next to printers around the building, the majority of your landfill material (by volume), is still paper/card. It may be worth putting up signs or posters above the printer recycling bins which clearly states they are for all paper/card waste, as most of these are currently unlabelled.

Co-mingled recycling and 10c: There is clearly some confusion with students as to what to put into the 10c recycling bins. Having more specific labels and perhaps changing the colour of the 10c bins (e.g. orange or white) may help reduce contamination. Installing co-mingled recycling bins as well (maybe turn your current yellow bins into these) could also help reduce contamination and will also fit better with household systems students may be more familiar with.

Reducing - 32% of the total volume

Packaging: Encourage staff and students to reduce their food and drink packaging wherever possible. There are great alternatives available, such as Keepcups/ re-suable coffee cups, beeswax/ silicon wraps instead of cling-wrap, re-usable water bottles and re-usable containers. Discussions about plastics and packaging are worth incorporating into classes, and there are numerous sites online with activates and lessons plans on the subject.

Composting - 19% of the total volume

Compostable material: Due to your separation of compostable paper, compostable material is only 15% of your landfill volume. Continue to remind students to use the green bins for compostable/ organic materials and consider getting bio-compostable cups in place of the Styrofoam ones to further reduce your waste stream. Again, posters and pictures on and around bins may help maximise collection. Consider putting signs/stickers on paper towel dispensers such as the one below (Figure 1) to reduce paper handtowel use.

Note: the material in your green bins is currently going to Jefferies (via SUEZ) for composting.

Uneaten food: The amount of uneaten food was quite low, however this could have been due to not having lessons after lunch (students may have eaten lunch off campus). Uneaten food (and food waste in general) can be incorporated into classes by discussing the negative externalities and flow-on effects of food wastage and how this ties into resource use and climate change implications.



Figure 1: Possible signage for handtowels in bathrooms