What's in the bin?

Year level

Upper primary to lower secondary with extension and simplified activities listed at end of lesson plan.

Lesson description

Students carry out a waste audit of a number of bins within the school to determine the types and volumes of waste produced within the school.

In this lesson students will:

- become aware of how to conduct a waste audit
- predict the outcome of the waste audit and compare predictions with actual results at the completion of the audit
- separate and classify waste according to material type and suitability for composting or recycling
- analyse and discuss results of audit including the properties of different materials and their impact on the environment
- investigate and discuss different systems for the separation and recovery of resources within the school

Curriculum links

Year 5

V 8.4 With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be *(Science - ACSIS231).* Compare data with predictions and use as evidence in developing explanations *(Science - ACSIS218)*

V 9 Pose investigable questions to identify patterns and test relationships and make reasoned predictions *(Science - AC9S5I01)*

V 9 Use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate *(Science - AC9S5I03)*

Years 5 and 6

V 9 Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use *(Design & Technologies - ACTDEK023)*

V9 Explain how characteristics and properties of materials, systems, components, tools and equipment affect their use when producing designed solutions *(Design and Technologies – AC9TDE6K05)*

V9 Propose actions or responses to issues or challenges and use criteria to assess the possible effects *(HASS - AC9HS5S06)*

Year 6

V 8.4 The effect that consumer and financial decisions can have on the individual, the broader community and the environment *(Humanities & Social Sciences - ACHEK017)*

V 9 Influences on consumer choices and strategies that can be used to make informed personal consumer and financial choices *(HASS – AC9HS6K08)*

Year 7

V 8.4 Science and technology contribute to finding solutions to a range of contemporary issues: these solutions may impact on other areas of society and involve ethical considerations *(Science - ACSHE120)*

V 9 Examine how proposed scientific responses to contemporary issues may impact on society and explore ethical, environmental, social and economic considerations *(Science – AC9S7H03)*

Year 8

V 8.4 Science and technology contribute to finding solutions to a range of contemporary issues: these solutions may impact on other areas of society and involve ethical considerations *(Science - ACSHE135)*

Materials

Waste audit kits can be borrowed for free from Brisbane City Council. This will supply the tools you need to do a waste audit. Register to borrow a kit on the Council's website.

- Rubbish bins that have not been emptied with a day's worth of rubbish (you can choose to audit internal bins from within the school)
  If you have not borrowed a Waste Audit kit, collect the following:
- 4 x tongs
- 4 x gloves
- Solid waste audit worksheet (attached)
- Clipboards
- Pens
- Calculator
- Posters: 'What goes in your recycling bin?'; 'What goes in your general waste bin?' and 'What goes in my worm farm or compost bin?' (available from Council's website)
- Resource: Guide to Reducing Waste in Schools (available from Council's website)
- tarpaulins
- Buckets labelled with different waste categories (e.g. compost, recyclables & general waste)
- Dustpan and brush, sponges, soap and water (for washing tarpaulins, tongs, buckets etc)
- Hand soap and water (for washing hands afterwards)

Before you start

Ensure that you have two wheelie bins (or other bins from within the school) containing a day's worth of general waste.

Before the audit, make sure that all participants can identify the different types of materials to be sorted into the three different buckets.

Refer to fact sheet 'What can be recycled?' and posters 'What goes in your recycling bin?' 'What goes in your general waste bin' and 'What goes in my worm farm or compost bin?' available on Brisbane City Council website for more information, or download Brisbane's Bin and Recycling App for additional information.

Recyclables include:

- plastic bottles and containers
- cans, foil and tins
- paper
- cardboard
- glass bottles and jars.

Compost material includes:

- fruit and vegetable scraps
- coffee grounds
- egg shells
- flowers.

General waste includes everything else such as:

- non-recyclable soft plastics, for example, plastic bags, cling wrap, muesli bar wrappers, chip packets, lolly papers and squeezable yoghurt tubes.
    - tissues and paper towel (for hygiene reasons these are placed in the general waste bucket)
    - food scraps that are not fruit or vegetables, including items such as meat, sandwiches, cakes, biscuits and full or partly filled drink containers.

Procedure

1. Explain the instructions for the waste audit and make certain that everybody is aware of the different types of materials and items that go in each of the three different buckets. Place posters in a clearly visible location that show what items can go in a recycling bin and what items can go in a compost bin.

2. Divide students into groups and explain that each group will audit one of the bins, but they need to remain seated until they have listened to all of the instructions.

3. Before you begin, ask each student to predict how much of their bin they think will be recyclable, how much will end in general waste and how much could be composted. Ask them to write their estimates down, but to keep them secret. In addition, ask them to predict what they think will be the most common item or material in their bin.

4. In a well-ventilated area out of the wind, place a tarpaulin down on the ground for each bin that is to be audited and place three sorting buckets (compost, recyclables and general waste) along one side of each of the tarpaulins.

5. Assign participants in each group to one of the following roles.
    - **Scribe**
        - records the volume of each category on the *Solid waste audit worksheet*
        - collects buckets, tongs and gloves for each group
        - ensures that everybody in the group helps to wash tongs, tarpaulin, gloves and buckets once audit is completed
    - **Runner**
        - responsible for taking buckets to the recorder when sorting is completed or when buckets are full
        - responsible for emptying buckets back into the original bin after the waste in that bucket has been recorded
        - assists with sorting
    - **Sorters**
        - each sorter is responsible for picking up either compostable, recyclable or general waste and placing material in the corresponding bucket
        - if there are a large number of students, teacher may need to organise students to swap roles every few minutes to ensure that every student apart from the scribe and runner have a turn at sorting waste

6. Ask all students apart from the sorters and the runner to sit around the edge of their tarpaulin.

7. Tip contents of one bin onto the tarpaulin.

8. Each group sorts waste into the three separate buckets labelled 'recyclables', 'compost' and 'general waste' using tongs or gloves. Once a bucket is full, or when the sorting process has been completed, the runner takes the bucket to the 'scribe'. The approximate amount in the bucket is estimated, for example, full, ¾ full and so forth and this amount is entered into the worksheet under the relevant heading - compost, recyclables or general waste. If there is more than one bucket of a particular type of waste to be recorded, the scribe just puts a plus sign between the amounts and adds them up at the end, for example if there were 3½ buckets of recyclables the scribe would write 1+1+1+½.

9. Once the volume of waste has been recorded, the runner empties the bucket back into the rubbish bin.

10. Sorting is completed when the only scraps left on the tarpaulin are smaller than a ten cent piece. At this stage all the buckets containing materials are measured and emptied back into the rubbish bin.

11. After each bin has been audited groups swap over so that every group has a turn at sorting the rubbish.

12. Wash all equipment and hands thoroughly.

13. Discuss results and compare with the predictions that students made about how much of each bin could be recovered through recycling or composting. What was the most common item in the bins? What was the most common material?

14. Ask students for suggestions about how to reduce the amount of general waste from the school ending up in landfill

Extension activity

Students create a bar graph and/or a pie graph to provide a visual representation of results.

Book an excursion to the Towards Zero Waste Education Centre at Brisbane Landfill to receive a waste education presentation with Brisbane City Council and tour or the landfill. This will give students the opportunity to learn more about moving towards zero waste, waste minimisation and landfill operations.

Simplified activity

Students create a graph of the different types of waste found in the classroom bin by pasting rubbish onto a large piece of paper or cardboard.

Solid waste audit worksheet

Simple solid waste audit record sheet								
School:			Class or group:				Date:	
Bin Number	Bin Location	RECYCLABLES		COMPOST		GENERAL WASTE		
		Amount (buckets)	Volume (litres) *see below	Amount (buckets)	Volume (litres) *see below	Amount (buckets)	Volume (litres) *see below	
E.g. Bin 1	Outside tuckshop	¾ bucket	6.75 litres	½ bucket	4.5 litres	1¼ buckets	11.25 litres	
1								
2								
3								
4								
5								
	TOTALS							

⅛ bucket =1.125 litres;¼ bucket=2.25 litres; ½ bucket=4.5 litres;¾ bucket=6.75 litres; ⅞ bucket=7.875 litres;1 full bucket = 9 litres. Note: If bucket is not the standard nine litre bucket, work out how large it is by filling it using a one litre jug or bottle and adjust figures.