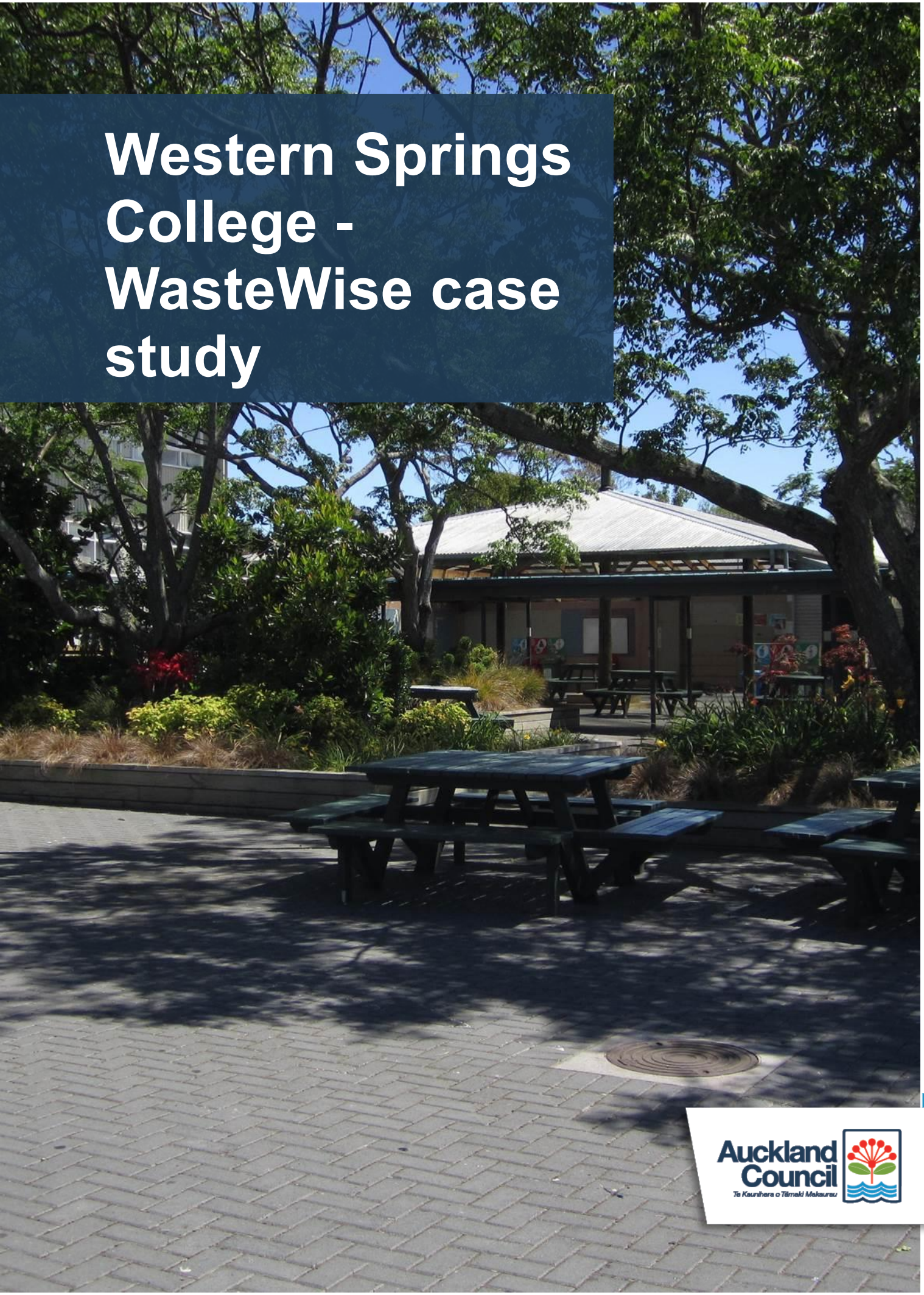
Western Springs College - WasteWise case study



Auckland Council
Te Kaunihera o Tāmaki Makaurau


Recyclables
Glass Cans
Plastics 1-7
Waste
Landfill
Food
Scraps
Recyclables
Glass Cans
Plastics 1-7
Waste
Landfill
Food
Scraps

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Foreword

This is one of a series of WasteWise case studies showcasing Auckland schools that are effectively minimising waste.

Aucklanders send over one million tonnes of rubbish to landfill every year. To combat this, Auckland Council is actively working towards an aspirational goal of zero waste by 2040 through its Waste Management and Minimisation Plan. Schools play a notable role in these efforts. With more than 1000 schools and early childhood centres in Auckland, students and teachers have the potential to reduce waste on a large scale. Schools provide children an opportunity to learn and practice responsible waste management every day. Students also take learnings home to their families, further educating the community about waste minimisation.

With student rolls ranging from less than 20 to over 3000, Auckland schools and early childhood centres have found a variety of ways to manage their waste. From worm farms to chicken coops, rubbish-free lunches to bin monitors, schools are doing their part to reduce waste sent to landfill. This series of case studies showcases some of the many routes schools can take to minimise waste. You will find detailed descriptions of waste systems and processes, new waste minimisation ideas, and evidence that reducing waste can also be good for a school's bottom line. We recommend reading multiple case studies and working with a team of teachers, students, caretakers, and senior management to develop a waste management plan that works for your school.

Ready to start reducing waste at your school? Auckland Council offers free waste minimisation support and resources to Auckland schools and early childhood centres. For more information, contact us at wastewiseschools@aucklandcouncil.govt.nz or by phone at 09 301 0101.

1 Executive Summary

"All students and staff, inspired by a love of learning, are challenged to discover and develop their unique personal strengths so that they are well equipped to share in the building of a just and sustainable society." – Western Springs College's mission statement

Western Springs College graduated from the WasteWise Schools programme in 2011 and is currently a Silver Enviroschool. In 2007, the Western Springs College's Board of Trustees set a strategic goal that the school "work towards environmentally sustainable practices in all areas of school life." To implement this goal, the Board established a Sustainability Panel. It consists of student leaders, teachers and a member of the senior management, among others. In 2011, the school applied to the Ministry for the Environment's Waste Minimisation Fund to establish a best-practice waste minimisation system. The funding was approved and they began efforts to reduce recyclable and compostable waste to landfill by two-thirds and non-recyclable packaging by 50 per cent. They achieved and exceeded these goals. From 2009 to 2015 there was a 58 per cent reduction in waste sent to landfill. This included an 81 per cent reduction in recyclable and compostable materials sent to landfill. In 2014, the school spent $4849 less on waste management compared to 2009. These savings were largely due to a reduction in waste to landfill and increased income from the sale of recycled paper (this program is no longer available). During this time there was a student roll increase of 25 per cent.

To achieve this, they implemented a waste system consisting of 37 bin stations, classroom paper bins, a commercial-grade worm farm, and six wheelie bin-sized bokashi bins. The students and school community were educated about the new waste system through assemblies, posters, games, and newsletters. The ground staff are the primary managers of the waste system, with students in years 9 and 10 actively involved in the management of the worm farm and bokashi bins.

NB: Some of the information in this case study was obtained from: WasteNot Consulting (2013). Western Springs College Waste Minimisation Project. Retrieved from Western Springs College website: http://www.westernsprings.school.nz/WesternSpringsCollege_NewsStories/WSC_Waste_Wise_Report_2013.pdf

2 School Information

Western Springs College

Location: Waitemata, Auckland

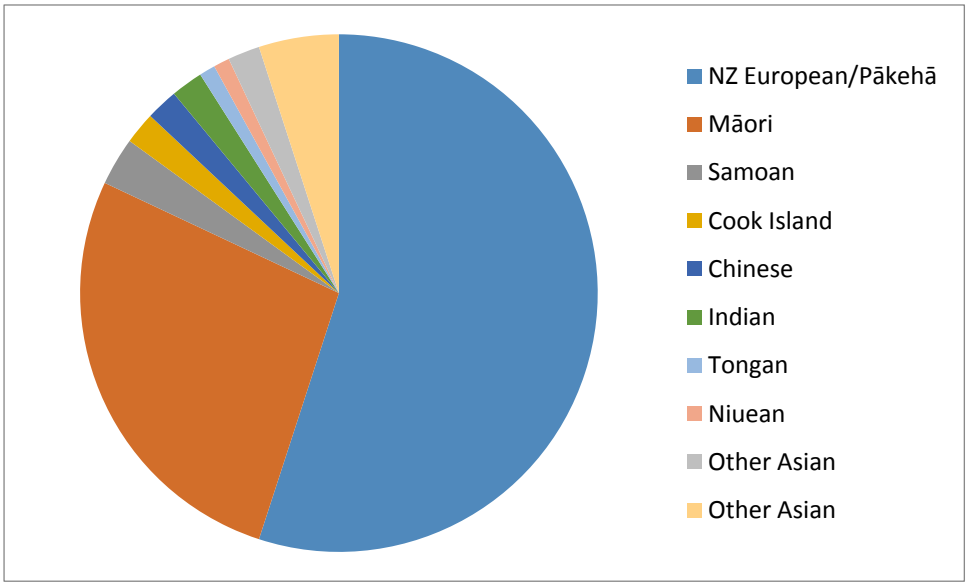
School type: Co-educational secondary, Years 9 to 13

School role (2015): 1293

Decile (2015): 8

Gender composition (2015): Boys 56 per cent, Girls 44 per cent

Ethnic composition (2015):



Number of international students (2015): 107

Academic achievement (2014):

- NCEA results:
  - Level 1: 88.2 per cent achievement
  - Level 2: 91.7 per cent achievement
  - Level 3: 93 per cent achievement

NB: School roll, decile, and demographics are obtained from the latest Education Review Office (ERO) report. Academic achievement information is obtained from the school's website.

3 Waste minimisation journey

For details of Western Spring College's waste minimisation journey from 2007 to 2013, see the Western Springs College Waste Minimisation Project report by WasteNot (see link on page 5). After the hard work and successes of the new waste system implementation there was a relaxed focus on waste in 2014. The students and caretaker became responsible for the waste program due to staff transitions. They realized that ongoing education is necessary to maintain the successes of the waste programme. A focus on waste was revitalized at the 2014 Trash to Fash Awards. The WasteWise team continues to promote waste minimisation among students and staff.

4 Waste management systems

4.1 Front-of-house systems – waste disposers

4.1.1 Set-up

Location	Set-up
Outdoor (33) and indoor (four) bin stations	• three 80L wheelie bins; closed lid • blue: recycling, red: rubbish, green: food waste
Classrooms	• one grey plastic box each • paper only, no rubbish
Food technology room	• several small rubbish, recycling and food waste bins
Art room	• one rubbish bin • one paper bin
Staff room	• one recycling wheelie bin • one waste wheelie bin • one paper bin • one small food waste bin
Staff resources room (adjacent to classrooms)	• one small food waste bin • one paper bin
Offices	• one paper bin • one small rubbish box • document destruction bin for confidential paper (not in all offices)
Canteen (prepares sandwiches and cakes, but not hot meals)	• one small recycling bin • one small rubbish bin • one small food waste bin
Rumaki - Te Reo Immersion Unit	• same systems but signage is Te Reo • two Molok underground storage bins converted into recycling bins
Rumaki catering service (inside Whare Kai)	• one food waste bin • one recycling bin

4.1.2 Procedure

Location	Procedure
Outdoor (33) and indoor (four) bin stations	Each day: • member of ground staff empties half of the bin stations using a tractor to swap out bins • transport the full ones to the waste compound Indoor stations: • ground staff carry down individual bins and place on the tractor • bins washed weekly on Friday; some food waste bins washed more often
Classrooms	• paper bins emptied into Full Circle wheelie bins as needed • ground staff place wheelie bins beside the library each day
All rubbish bins in the following rooms are emptied by cleaners	
Food technology room	• food waste and recycling bins emptied as needed into the outdoor station
Art room	• paper bin emptied as needed into the Full Circle wheelie bin
Staff room	• staff empty bins into outdoor station as needed
Staff resources room (adjacent to classrooms)	• staff empty bins into outdoor station as needed
Offices	• staff sort and empty rubbish box into the appropriate bin • staff empty paper bin into Full Circle wheelie bins as needed • staff place confidential paper in a document destruction bin at reception
Canteen (prepares sandwiches and cakes, but not hot meals)	• canteen staff sort and empty bins as needed into the nearest outdoor station
Rumaki - Te Reo Immersion Unit	• bin stations are emptied using the same procedure as the college's outdoor stations • food waste and recycling buckets emptied into an outdoor station

4.1.3 Signage

- New Zealand's National Recycling Symbols
  - free to download and use
  - colour-coordinated with bins
  - attached to all bins as stickers
- additional stickers were designed in Te Reo for the Rumaki
- school designed its own signage for the wheelie bin stations
  - incorporated photos of waste items found during the waste audit and items commonly sold in the canteen
- small round stickers using the waste system colours and the students' cartoon designs were placed on all canteen items sold in the first few weeks after the system launch
  - students identified the correct bin for each item easier with this system
  - assisted students in identifying the correct bin for each item

4.1.4 Litter

Each form class was scheduled a time to clean an area of the school. Students collected litter with a bucket and a glove.They sorted it at a bin station, rinsed the bucket, and returned the bucket and glove to their form teacher. Students spend around 20min on litter duty. Ground staff also collected litter at the end of the school day or as required.

4.2 Back-of-house systems – waste collectors and processors

	Procedure	Provider
Co-mingled recycling (plastic/aluminum/ glass/steel)	• ground staff collect recycling from half of the waste stations each day • bins emptied into 21 Auckland Council 240L recycling wheelie bins • bins are stored in the caretaker's compound • wheelie bins emptied fortnightly by the service provider • Rumaki's moloks are emptied on-site as needed (usually twice per year) by the service provider	Auckland Council: mixed-recyclables service; no cost in this area Mr Bins for the moloks: around $130 per collection
Paper/cardboard recycling	• ground staff place one of two 1100L Fullcircle wheelie bins beside the library each day • classroom bins emptied into wheelie bins • ground staff place bins back in the storage area beside the caretaker's compound • emptied twice per week on-site by service provider	Fullcircle: Paper from Homes initiative is no longer available

Confidential paper recycling	As required, service provider collects on-site	Reclaim
Food waste	• collected from half of the waste stations each day • Years 9 and 10 and Rumaki students assist with food waste management three days per week • sorted into either one of four bokashi bins or into a worm composting unit	On-site; no cost
NB: A Queensland fruit fly was found in the area in early 2015, leading to strict control of fruits and vegetables moving into and out of the school. During the 2015 school year, all food scraps were picked up from the school free of charge by the Ministry for Primary Industries		
Green waste	• ground staff compost green waste on-site • used to fill landscaping pits • previously ground staff placed it into sacks provided and collected by Green Acres	On-site; no cost
Rubbish to landfill	• ground staff collect rubbish from half of the waste stations each day • bins emptied into skip bin beside the caretaker's compound • skip bin is emptied on-site by the service provider once per week	Waste Management NZ Limited: around $150 per bin collection plus a bin hire fee
Garden (three on site)	• Years 9 and 10 students and Rumaki students transfer worm castings, worm wee and bokashi scraps to the garden as needed • Done in conjunction with their management of the worm farm and bokashi bins	On-site; no cost

5 Waste minimisation education

5.1 Before launch

School assembly	• project consultants hosted a special assembly at end of Term 2 in 2012
	  ○ 10min skit which identified issues, outlined how students could contribute to the solution
	  ○ introduced new bin stations

Newsletter	• sent to students and families to introduce them to the project
Posters	• explained the appropriate bin for common waste items
Pamphlet	• explained the new waste systems to community education participants who use the premises after school hours
Power-point presentation	• waste minimisation facilitator presented at the Trash to Fash awards to inspire them to reduce waste
Litter collection	• litter collection was a punishment

5.2 At launch

Details of these activities can be found in the Western Springs College Waste Minimisation Project report by WasteNot (link provided on page 5)	
School participation	• bulletin quiz • litter sorting game • baled recyclables • Sorted on Waste game • form class sorting activity • prize draw for proper bin use • teachers' training session

5.3 After launch

Power-point presentation	• Deputy principal presented in the senior assembly and in all junior social studies classes at the beginning of Term 4 in 2012 ○ included waste audit results after implementing the new systems and a reminder about proper use of the system
Maui's Dolphin litter campaign	• challenged students to reduce litter and to see littering as a moral issue. Details can be found in the Western Springs College Waste Minimisation Project report by WasteNot
Litter collection	• collected by all classes • responsibility of WasteWise student leaders

5.4 Ongoing

WasteWise team	• 11 students and two teachers • two student representatives and one or both teachers attend the Sustainability Panel meetings • actively work to minimise the school's waste • educate the student body about waste • hosts WasteWise day each term • speak about waste at assemblies, have an article in the daily notices, and make videos for school website • give prizes to students who have no rubbish or plastic wrapping in lunchboxes
Sustainability Panel	• students, staff, senior management, and parents participate in a Sustainability Panel which meets once per term • comprised of the Wises teams: WasteWise, TravelWise, HealthWise, and Eco Warriors
Eco Warriors team	• occaisionaly participate in waste minimisation actions
New Student Booklet	• includes a page on the school's recycling system
Wises team	• host a Wises Week which includes a focus on waste
Trash to Fash	• annual inter-house competition for which students create garments out of trash

Annual Year 9 picnic	• waste minimisation practices are modelled for incoming students and parents
All school events	• use the multi-bin system so that waste management can be business as usual

5.5 Formal education

Rubbish reduction and reuse is covered in many courses, including:

- Year 9 Science:
  - Class visits
  - manage worm farm and bokashi bins
  - participate in beach and creek clean-ups
- ESOL teacher takes international students to the worm farm to help them better understand the waste system
- Environmental Studies, Levels 2 and 3 Education for Sustainability standards:
  - course aims to develop an understanding of the impacts of human behaviour within our environment and how to address these issues
  - students complete a research project on an environmental issue and carry out an action to make a difference in the school or community
    - This project could focus on waste issues

5.6 Other

- a pair of Environmental Studies students researched single-use packaging
  - presented at an assembly to the entire school about single-use plastics and alternatives
  - invited the school community to a showcase of sustainable lunch packaging
    - cloth sandwich wrap, fabric bags, reusable hard plastic drink and snack carriers, and a Glad wrap alternative made from cotton cloth and beeswax
- school uses ceramic cups instead of disposable cups for events
- school sold reusable water bottles to students at cost

6 Time requirements for waste management

Ground staff/caretaker	• one member:
	  ○ eight hours per day managing bin stations
	  ○ two hours per day managing worm farm and bokashi bins
	• variable hours collecting litter

Teachers	• two teachers:
	  ○ participate in the Sustainability Panel once per term for 1.5 hours
	  ○ supervise the WasteWise team for one hour per week

Students	• 10 students:
	  ○ one hour per day, three times per week managing the worm farm and bokashi systems
	• Each form class:
	  ○ 20 minutes per day, twice a week collecting litter from a designated area
	  ○ ongoing care for their area outside
	• WasteWise team:
	  ○ meet one hour per week
	  ○ additional time planning and coordinating events as needed
	  ○ two representatives:
	  ▪ participate in the Sustainability Panel once per term for 1.5 hours

Senior management	• member of senior management participates in the Sustainability Panel once per term for 1.5 hours

7 Waste minimisation policies

Western Springs College has instituted the following waste minimisation policies:

- the school's mission statement states, "All students and staff, inspired by a love of learning, are challenged to discover and develop their unique personal strengths so that they are well equipped to share in the building of a just and sustainable society."

- the Board of Trustees set a strategic goal that the school "work towards environmentally sustainable practices in all areas of school life." They established the Sustainability Panel to implement this goal

- in 2011, the Board of Trustees set a target of reducing recyclable and compostable waste to landfill by two-thirds and non-recyclable packaging by 50 per cent by September 2012. The completion date was later extended to March 2013. *NB: These targets were met and exceeded*

8 Waste audit data

The WasteWise team conduct waste audits yearly with the help of the school's Enviroschools facilitator. The 2015 audit took approximately 1.5 hours.

8.1 Waste audits - one day's waste

- students completed waste audits in 2009, in 2012 during implementation of the new system, and in 2015
  - there was a 58 per cent reduction in waste sent to landfill including an 81 per cent reduction in divertible materials sent to landfill
    - this included a 43 per cent reduction in recyclable plastics and a 78 per cent reduction in compostable materials sent to landfill
- waste audit data is provided in Appendix 1
- a summary is shown in the figure below

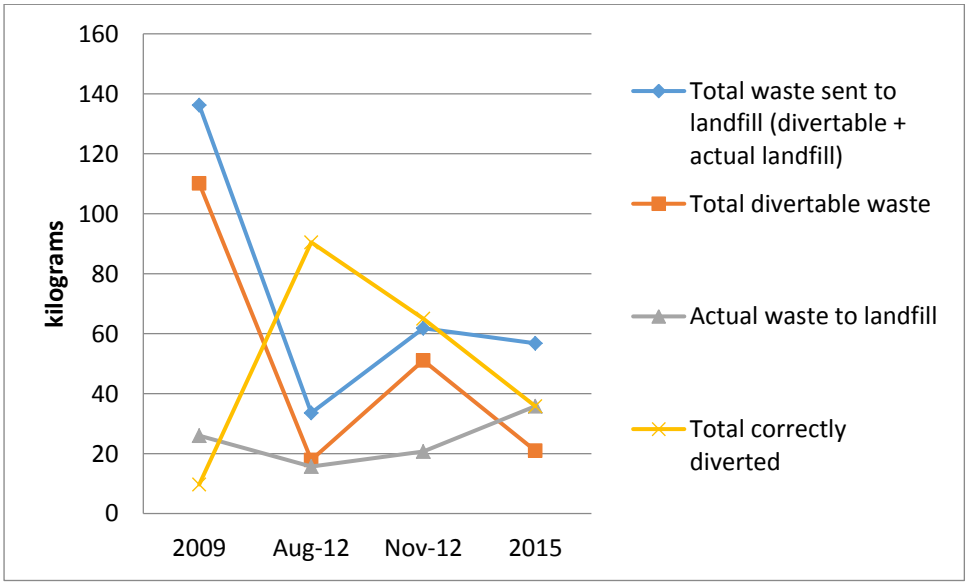


Figure 1: Waste audit summary from 2009 to 2012

8.2 Waste audits - one week's waste

- WasteNot consultants completed waste audits in 2012 and 2013, before and after the system implementation
  - there was a 73 per cent reduction in waste sent to landfill including an 80 per cent reduction in divertible materials sent to landfill
    - this included a 68 per cent reduction in recyclable materials and an 85 per cent reduction in compostable materials sent to landfill
- the waste audit data is provided in Appendix 1.1
- summary is shown in the figure below

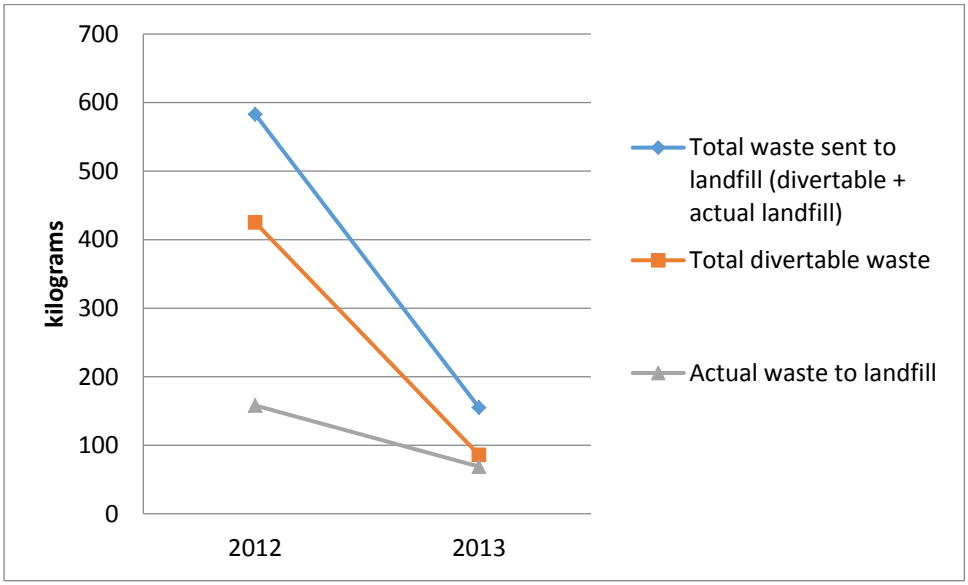


Figure 2: Waste audit summary from 2012 to 2013

9 Waste management financial report

The full data for annual waste expenditures and incomes is provided in Appendix 2.

9.1 Annual waste expenditures

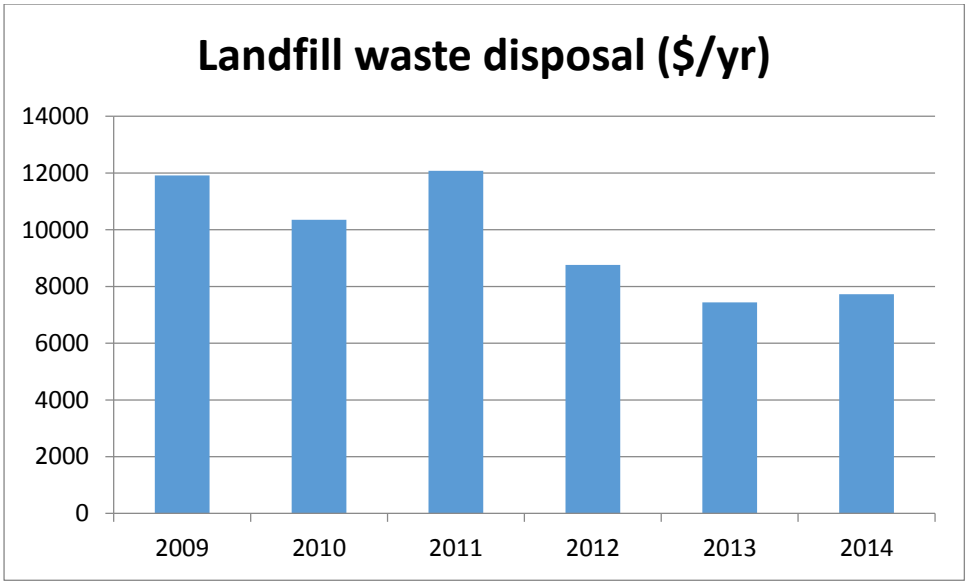


Figure 3: Summary of annual waste expenditure 2009-2014

Notes:

- above table shows a decline in the net amount of money spent sending rubbish to landfill
- school used Green Acres for green waste disposal prior to 2013
  - they were unable to determine the cost of this service for these years
- the school roll increased 25 per cent in the period of 2009 to 2015
- does not show annual income received from the Paper from Homes Initiative because it is no longer available

9.2 One-time expenses

- four mobile bokashi bins at $300 per bin (total - $1200)
- one Tat-G worm composting unit for $6000
- bin stations
  - 111 wheelie bins at $47.50 per bin (total - $522.50)
  - 33 signage boards at $115 per board (total - $3795)
  - 33 bin station wooden frames at $350 per frame (total - $11,500)

9.3 External funding

- Ministry for the Environment's Waste Minimisation Fund:
  - $55,460 to "invest the time, resources and funds to establish a best practice model so other schools do not have to invest at the same level in order to gain similar outcomes."
  - had to show a 50 per cent reduction in waste

9.4 Other income sources

- possible fundraising with handmade beeswax food wraps

10 Photos

Figure 3: Outdoor bin station

Figure 4: Rumaki bin station with signs in Te Reo

Figure 5: Classroom paper recycling box

Figure 6: Staff room bin station and food waste bin under the bench

Figure 7: Recycling, rubbish, and food waste bins in canteen

Figure 8: Skip bin for landfill waste

Figure 9: Wheelie bins for kerbside mixed recyclables collection

Figure 10: Large wheelie bins for paper and cardboard collection

Figure 11: Tat-G worm farm for food waste

Figure 12: Large bokashi bins made from wheelie bins on top of wooden platform

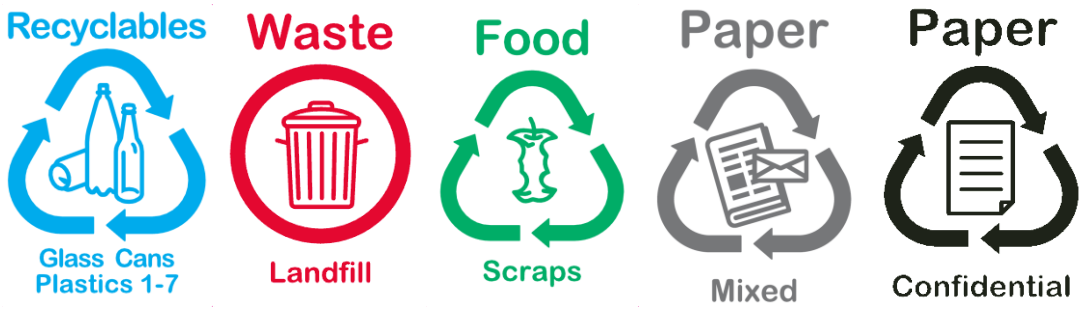


Figure 13: New Zealand's National Recycling Symbols used as labels on all bins.

Figure 14: Student-designed bin station signs

Figure 15: Stickers used by canteen during the first few weeks of the new waste system. The stickers indicated which bin students should place each canteen item

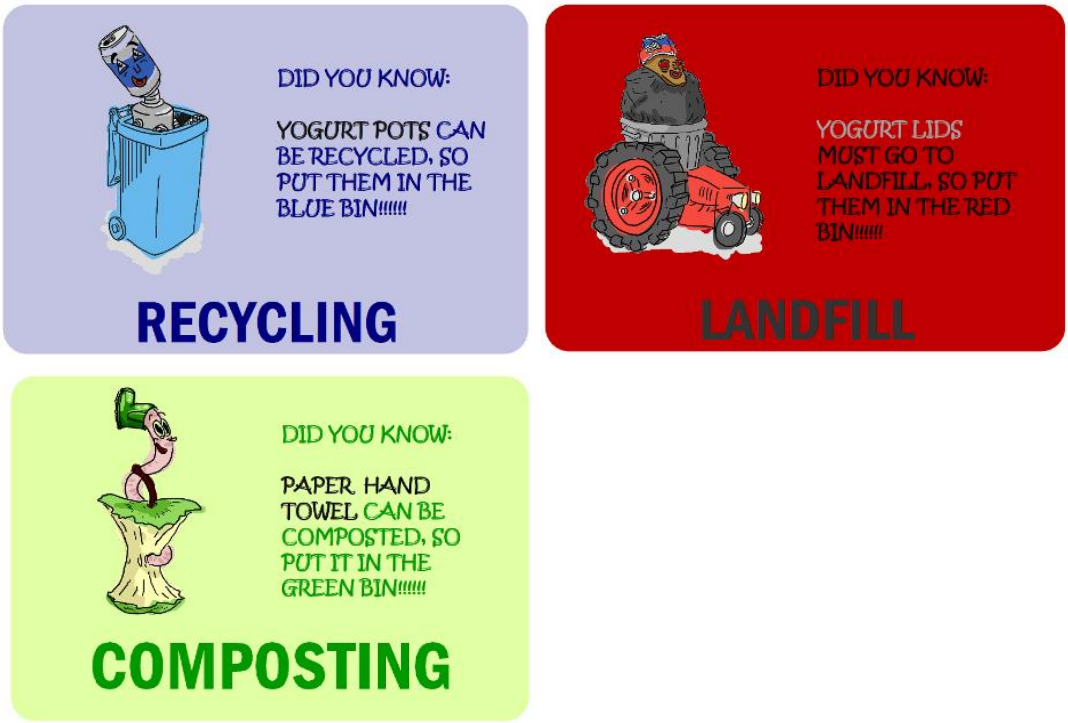


Figure 16: Posters used before and during the launch of the new waste system

NB: Photos are from the Western Springs College Waste Minimisation Project report by WasteNot.

11 Appendix

11.1 Appendix I – Waste Audit Data

- **July 2009**
  - one day landfill waste total (outdoor bins only): 136.2kg (0.13kg per student)
  - could have been diverted: 110.1kg
    - including 24.0kg paper/cardboard , 7.0kg plastic and 77.7kg organic waste
  - actual landfill waste: 26.0kg
  - Correctly diverted: 9.7kg
    - including 9.7kg mixed recyclables

- **August 2012**
  - one day landfill waste total: 33.6kg (0.026kg per student)
  - could have been diverted: 17.9kg
    - including 4.1kg paper, 2.6kg plastic and 10.4kg organic waste
  - actual landfill waste: 15.7kg
  - correctly diverted: 90.5kg
    - including 37.2kg mixed recyclables and 53.3kg organic waste

- **November 2012**
  - one day landfill waste total: 61.8kg (0.048kg per student)
  - could have been diverted: 51.1kg
    - including 6.6kg paper, 10.2kg plastic and 12.5kg organic waste
  - actual landfill waste: 20.7kg
  - correctly diverted: 65.0kg
    - including 13.1kg mixed recyclables and 51.9kg organic waste

- **March 2015**
  - *NB: Extrapolated from an audit of the six most-used bin stations. These are located near food areas, so organic waste and total waste may be overestimated.*
  - one day landfill waste total: 56.8kg (0.044kg per student)
  - could have been diverted: 21kg
    - including 4kg plastics and 17kg organic waste
  - actual landfill waste: 35.8kg
  - correctly diverted: 152.6kg
    - including 56.8kg mixed recyclables and 95.8kg organic waste

11.2 Appendix I.1 – Waste Audit Data

- **May 2012**
  - one week landfill waste total: 583kg (0.45kg per student)
  - could have been diverted: 425kg
    - including 97kg paper, 97kg plastic and 245kg organic waste
  - actual landfill waste: 158kg

- **February 2013**
  - one week landfill waste total: 155kg
  - could have been diverted: 86kg
    - including 40kg of recyclables and 45kg of organic waste
  - actual landfill waste: 69kg

11.3 Appendix 2 – Annual Waste expenditures (-) and income (+)

Waste management costs by year	Landfill waste disposal	Green waste disposal	Recycling Collection			Total ($/year)
			Paper/ cardboard	Plastic/glass	Metal	
2009	-$11,915	Unknown	$0	$0	$0	-$11,915
2010	-$10,351	Unknown	$0	$0	$0	-$10,351
2011	-$12,079	Unknown	+$660	$0	$0	-$11,419
2012	-$8757	Unknown	+$660	$0	$0	-$8097
2013	-$7442	Unknown	+$660	$0	$0	-$6782
2014	-$7726	$0	+$660	$0	$0	-$7066

- Notes:
  - numbers are rounded to the nearest dollar
  - above table shows a decline in the net amount of money spent sending rubbish to landfill
  - they spent $4849 less on waste management in 2014, compared to 2009
    - includes income from the Paper from Homes initiative, which is no longer available
  - used Green Acres for green waste disposal prior to 2013
    - unable to determine the cost of this service for these years

- Paper from Homes income
  - based on an approximate income of $60 per month for the 11 months of the school year
  - no longer available
- the school roll increased 25 per cent in the period of 2009 to 2015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WasteWise Schools

August 2015