

WOW in Curriculum

In this section:

Topics with suggested learning activities

Early/Primary Years

Middle/Senior Years

Are as follows:

- Waste Minimisation
- Reducing / Reusing
- Purchasing and Packaging
- Organics (food and garden material/waste)
- Recycling
- Litter
- Cultural / Historical / Futures Perspectives

Waste in Curriculum, samples from schools



Wipe out Waste

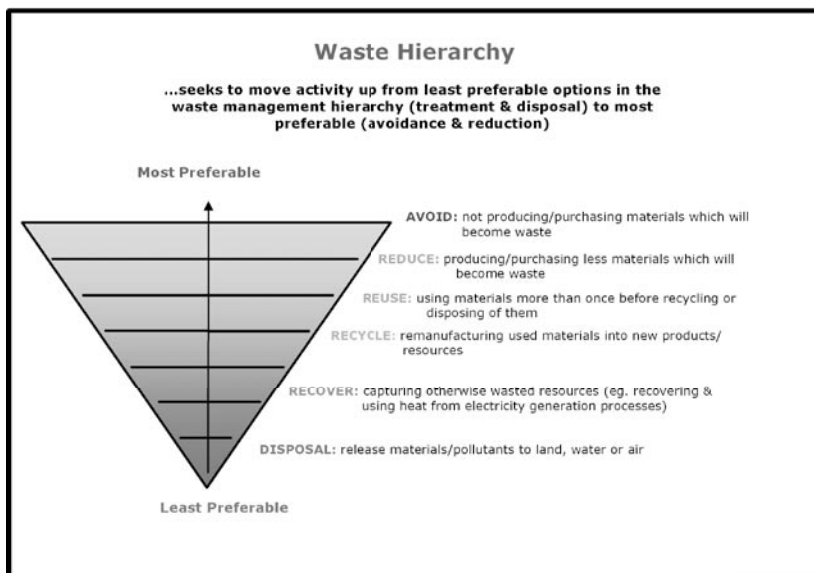
Waste Minimisation

Currently over 1 million tonnes of solid waste is sent to landfill in SA per year.

That equates to almost 1 tonne / person / year in SA (or over 2kg per day).

South Australia's strategic plan aims to reduce this by 25% by 2014.

To create a sustainable future, we must act now to reduce waste at school, at home and at work.



The Waste Hierarchy is an accepted philosophy for prioritising and guiding efforts to manage waste. Waste avoidance and reduction, are the optimal approach to waste management followed by reuse, recycling and recovery, with treatment and disposal of waste the least preferred options.

(Adapted from SA's Waste Strategy 2005).

Schools and communities are generally familiar with the concept of the 3Rs (or 5Rs, including rethink and refuse). These are outlined below, and explained in terms of priority and effectiveness.

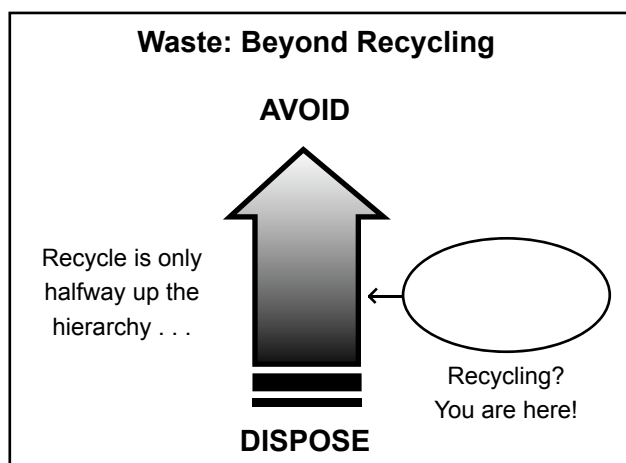
'It's important to remember that the 3Rs of waste reduction are not equal!

Reducing the volume of products we consume is the most important of the 3Rs because it reduces our impact on the environment the most. **Rethinking** the types of products we purchase and refusing excess packaging are important aspects of avoiding and reducing waste.

Reusing materials comes next in the waste hierarchy. When we reuse, we save more than just the material from which a product is made. Large quantities of energy that we can't see and don't think about – 'embedded/embodyed' energy – are also part of every product, built into it from mining to manufacture to disposal with transportation involved at every stage of its life.

Recycling lessens our environmental impact to a smaller degree than reducing or reusing. While recycling conserves energy and raw materials, it also requires energy to collect, sort, clean, melt or pulp, and remanufacture recycled materials into new items. With some materials, each round of recycling diminishes the quality of the recovered materials.

For these reasons, it is important to reduce and reuse as much as possible and only then resort to recycling.



Waste Minimisation

Avoid, Reduce, Reuse, Recycle

Level of Achievement	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions	Waste avoidance, reduction, reuse and recycling identified as a priority issue for the school	Investigating waste avoidance, reduction, reuse and recycling principles and practices and developing action plans	Implementing waste avoidance, reduction, reuse and recycling principles and practices across the school community	Waste avoidance, reduction, reuse and recycling practices are successfully embedded in learning, decision-making and operations throughout the school community
Area	Indicators			
Whole School	<ul style="list-style-type: none"> Waste issues raised / identified by staff, students and/or community School governing council informed and involved Consultation occurring with staff, admin, parents, canteen, grounds and cleaning staff 	Collecting baseline data on current practices and sharing with whole school community by: <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site Developing, documenting and promoting whole-school: <ul style="list-style-type: none"> Vision, principles, action plans Set % waste reduction targets and timelines for action Policies and strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies 	<ul style="list-style-type: none"> Waste reduction, reuse and recycling are incorporated into all school policies and plans Outcomes are documented, promoted and acknowledged Waste reduction, reuse and recycling have become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement
Management Systems	Understanding that: <ul style="list-style-type: none"> waste management systems can reduce waste to landfill significant cost savings can be made with waste minimisation practices recycling can generate funds for school 	<ul style="list-style-type: none"> Auditing waste streams at site Assessing systems and procedures Researching options for improvement 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Engaging external service providers to support waste reduction, reuse and recycling initiatives 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring school waste issues 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about waste avoidance, reduction, reuse and recycling best fits Auditing waste streams at site Exploring waste through integrated learning programs 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change 	<ul style="list-style-type: none"> Waste avoidance, reduction, reuse and recycling are integrated across the curriculum
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered 	<ul style="list-style-type: none"> Identifying relevant community resources and support 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers 	<ul style="list-style-type: none"> Best waste avoidance, reduction, reuse and recycling practices are modelled for the wider community Student participation in community and environmental forums is supported Students share their learning through actions with the wider community



Wipe out Waste

Key Messages

- We are all responsible for minimising waste to live sustainably.
- Ecosystems are disturbed when we make products and dispose of waste materials.
- The most effective way to reduce our impact on the environment is to reduce the volume of products we manufacture and consume.
- Saving materials from being wasted benefits the environment by conserving natural resources and reducing energy consumption for their extraction, processing and transportation.
- Practising the 3Rs sustains the use of material, reduces waste and helps the environment. Altering the product life cycle by reusing, composting or recycling saves energy and resources, preventing waste and pollution.
- Reusing materials saves materials and energy.
- There is an increasing number of jobs in the resource recovery industry.

Key Words

waste	landfill	impact	waste stream	disposable	transportation
degradable	reduce	leachate	rethink	manufacture	life cycle
environment	biodegradable	reuse	process	eco-efficiency	sustainable
pollution	product	rubbish	renewable	resource	non-renewable
recycle	sustainability	consume	resource recovery	responsibility	legislation
climate change	recover	emissions	dispose	management	compost
materials	refuse	conserve	extraction	closed-loop recycling	
recyclable	manufacture	avoid	eco-footprint	open-loop recycling	

Search Words and Phrases

waste hierarchy	global economy
life cycle analysis	by-product
resource recovery	product stewardship
consumerism	supply chain management
waste streams	embodied / embedded energy
cradle to grave	greenhouse gas emissions
eco-efficiency	national packaging covenant
ecological footprint	corporate responsibility
eco footprint	obsolescence
natural resources	

Suggested Learning Activities

Early / Primary Years

Discuss the types of materials placed in general waste, recycling and green waste bins at school and home. Outline the differences/similarities between materials placed in each bin and explain why they are separated. Investigate what happens to the contents of each type of bin. Are the same collection systems used at home and at school? From what you have discovered can you make recommendations to improve your school systems? Note: Local Council websites and brochures provide information about waste management services in your area.

Work in groups to design a method for measuring and analysing the waste generated in one day/week in your classroom, home or school. (Modify this activity by using students' recess and lunch waste for one day.)

- Sort waste items into different materials (products and packaging)
- Organise and present data for different waste streams (paper, plastic, food etc)
- Calculate potential waste generated for one month / year.
- Identify disposal, recycling and reuse options.
- Generate a list of waste reduction strategies for one waste stream in your school.
- Design an information brochure or poster to educate the community about actions they can take to reduce waste.

Create a story board / diagram to describe the life cycle of one waste item or material. eg magazine, apple core, drink bottle or paper, food scraps, plastic. Consider the following: natural resource use and recycling, manufacture and transport, sales and marketing, human use and disposal. Communicate to an appropriate audience how this information will change your behaviour.

Predict what happens to different materials such as; paper, cardboard, glass, steel, aluminium, food, cloth and different types of plastic when they are buried in a landfill. Conduct an experiment to test breakdown rates. Bury

materials in a school garden or soil filled box, excavate and record observations weekly.
How will the results of your experiment influence waste management in your school?

Describe how you would feel if your school oval or a local park was to be developed into a landfill site. Consider impacts on the community and environment. Debate the issue and/or write to local government asking where waste from your area is currently disposed and future plans. Alternatively, consider the impacts of dumping waste in the sea or launching it into space. Discuss how your behaviour now can influence waste management in the future.

Identify health and safety issues associated with waste disposal and recycling. Develop a health and safety manual or poster for waste and recycling monitors in your school. Present this to the monitors. Consider the following:

- The cleanliness of lids, handles and interior of school waste bins.
- Hygiene precautions (eg gloves, tongs and hand washing), pests and disease.
- Hazards (chemicals, sharps, heavy items, sanitation)
- Who is responsible for waste management in your school? Do they know about these issues?





Suggested Learning Activities

Middle / Senior Years

Explore the life cycle of a commonly used/consumed item. Research the primary and secondary industries involved from the collection and processing of raw materials to manufacture, marketing and distribution. Consider the waste generated at all stages and investigate waste disposal, reduction and recycling options. Is it an example of 'open loop' or 'closed loop' production? How might this information influence your purchasing and/or waste management practices?

Research the design and construction of modern landfills. Distinguish the features of a suitable and unsuitable location for a landfill site (environmentally, socially and economically). Identify potential environmental hazards and explain how these are managed. Describe an innovative alternative to landfill. How can you increase resource recovery at your school?

Investigate and document waste management systems and reduction strategies in your school. Design and produce an information brochure or electronic media presentation that can be used as part of an induction package for new students and staff. Include the following:

- School environmental policies and waste reduction targets
- Student, staff and parent responsibilities
- Location of waste / recycling bins and collection points for reusable materials
- Sorting and preparation of materials for recycling (eg separate, crush, rinse)
- Health and safety considerations

Identify the components of a computer, mobile phone or television that are hazardous e-waste. Research the disposal / recycling options and costs. Who is currently responsible for resource recovery costs? Predict how this might change in the future? Examine current school and home practices with regard to disposal of these items and make recommendations to the whole school community.

Outline the issues associated with current government legislation to reduce the use of plastic shopping bags. Consider the following:

- What are the ecologically sustainable alternatives?
- How are plastic bags hazardous to wildlife?
- How many plastic bags currently end up in landfill and why is that a problem?
- Will banning plastic shopping bags reduce the amount of plastic going to landfill?
- Compare local and global opinions and initiatives.
- Design and conduct an experiment to test the biodegradability of different types of plastic bags.

What actions will you take as a result of your findings?

Compare the energy used to produce a product in your school made from recycled material with a similar or identical product made from virgin material/resources. Include transportation costs in your comparison. Does the purchase price reflect the energy costs? How does the pricing of these products affect you as a consumer?

Research situations where consumer demands or safety considerations have resulted in changes to the production and use of various materials to be more environmentally responsible (eg lead-based paint, oil disposal, asbestos, copper chromium arsenate-treated timber). Consider current and future issues for commonly used items.

Critical Literacies Activity

Review SA's Waste Strategy. Compare and contrast texts from different sources on a similar environmental issue. Communicate your feelings and findings and explain how this will change your behaviour.

Reducing & Reusing

Reducing involves producing or purchasing less material that will become waste. Rethinking purchasing practices and refusing unnecessary items are additional strategies to avoid and reduce waste.

Reusing refers to using materials more than once before recycling or disposing of them.

Cartoon

Key Messages

- The most effective way to reduce our impact on the environment is to reduce the volume of products we consume.
- Reusing materials saves more than just the material from which a product is made. Every product contains 'embedded/embodyed' energy, built into it from mining to manufacture to disposal, and includes transportation at every stage of its life.
- Purchasing durable items that can be repaired will enhance the longevity of the item and reduce the need to replace it.
- Reducing and reusing are the most effective actions for long-term waste minimisation.
- Rethink and refuse material/packaging which is difficult to reuse or recycle.

Key Words

recycle	landfill	impact	disposal	durable	repair
double-sided	reduce	waste	replace	conservation	energy
environment	single-sided	reuse	mining	manufacture	transport
pollution	product	save	volume	audit	stationery
recover	paper	consumer	second-hand	pre-loved	minimisation
longevity	resource	cardboard	charity	single-use	processing
			throw away	obsolescence	shelf-life

Search Words and Phrases:

extended producer responsibility
embedded/embodyed energy

waste minimisation
throw-away society



Wipe out Waste

Reducing & Reusing

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	Waste reduction, reuse and recycling identified as a priority issue for the school	Investigating waste reduction & reuse principles and practices and developing action plans	Implementing waste reduction & reuse principles and practices across the school community	Waste reduction & reuse practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Waste reduction and reuse issues are raised / identified by staff, students and/or community School governing council informed and involved Consultation occurring with staff, admin, parents, students, canteen, grounds and cleaning staff 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> Vision, principles, action plans Set % waste reduction targets and timelines Policies and strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies 	<ul style="list-style-type: none"> Reduction and re-use are incorporated into school policies and plans Outcomes are documented, promoted and acknowledged Reduction and re-use have become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement.
Management Systems	<p>Understanding that:</p> <ul style="list-style-type: none"> Waste minimisation systems can reduce waste to landfill Significant cost savings can be made with waste minimisation practices 	<ul style="list-style-type: none"> Auditing waste streams at site Assessing systems and procedures Researching options for improvement 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Engaging external service providers to support waste reduction and re-use initiatives 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring school waste issues 	<ul style="list-style-type: none"> Curriculum audit of where learning relating to waste reduction and reuse practices currently (or potentially) fits in your curriculum planning Exploring / investigating waste reduction and reuse in the curriculum Auditing waste streams at site 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change 	<ul style="list-style-type: none"> Reuse and recycling are integrated across the curriculum
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered 	<ul style="list-style-type: none"> Identifying relevant community resources and support 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers 	<ul style="list-style-type: none"> Best practices are modelled for the wider community Students share their learning through actions at home and with the wider community Student participation on community and environmental forums is supported

Suggested Learning Activities

Early / Primary Years

Select a common waste item (e.g. egg carton, milk carton, steel can, fabric) and brainstorm ways it could be reused. Put your ideas into practice and promote reuse strategies to the whole school community.

Explore concepts of giving, sharing, swapping, trading and buying. Recount personal experiences about 'hand-me-downs', 'trash and treasure', garage sales or an unfair swap. Plan and conduct a class/school swap day or lunch time second-hand stall.

Reuse waste materials to create puppets, musical instruments, masks or costumes for a school or public performance which promotes waste reduction and reuse.

Devise a method to measure the quantity of paper used in your classroom. Include work books per student, A3 sheets, printing, tissues, photocopying, paper towel. Identify the amount of paper being reused or recycled and develop paper saving strategies. Implement and monitor over time. Share your findings with relevant school staff (eg bursar) and committees to develop whole school actions to support your strategies.

Make a list of things that we sometimes waste at school such as paper, food, water and electricity. Discuss with reference to saving money, time, resources and energy. Identify reasons why it is important to reduce wastage. Generate and suggest actions for your school to reduce wastage.

Discuss how materials are reused by industry in the community (eg construction, automotive, electronic). List how various items have been reused in your school. Design and construct a mobile or model from reused materials, using suitable cutting and joining techniques. Display to the whole school community.

Interview parents or contact your local council to find out which common household items are not collected for recycling (eg bread bags, chip packets and bottle tops). Investigate why, explore alternatives and formulate ways your school community can reduce the use of these items.



Suggested Learning Activities

Middle / Senior Years

Work in groups to investigate the reuse of items/ materials within the school. Prepare a Reuse Report for one area (classroom, canteen, art, book room) which includes potential opportunities for your whole school community to reduce waste by conserving, sharing or swapping resources. Present your report to the appropriate school authority.

Investigate how items that are no longer required at school or home can be reused in the community (eg charity donation of goods, second-hand / antique shops, 'hand-me-downs', markets and garage sales). Organise a school event such as the collection of items for a charity or a student 'Trash and Treasure' swap.

Research waste practices in your home or school to develop a Zero Waste message. Reuse a range of collected waste materials to create a two or three-dimensional presentation to communicate this message in your community.

Debate the merits of using hand towels, paper towels or air dryers in school toilets. How will you present your arguments to the whole school community?

Investigate current stationery management practices at your school and prepare a report for presentation to relevant school groups. Include possible changes and recommendations to reduce the number of items purchased, save money and reduce waste. Consider the following:

- double-sided paper use
- unused pages in exercise books
- use of plastic sleeves to cover exercise books
- refillable pens and lead pencils
- glue, paint, art/craft supplies (bulk purchasing, sharing resources)
- class stationery sets eg coloured pencils, scissors, rulers, erasers etc.
- class text book sets.

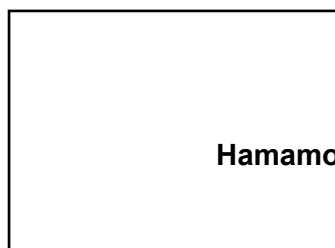
We live in a 'throw away society'. Research this term and others including 'disposable', 'durability', 'obsolescence', 'shelf-life', 'fashion' and 'convenience'. Discuss values associated with consumerism / capitalism. How are these values reflected in purchasing practices at school and in your home?

Research the biodegradability standards for plastics. What measures might you adopt in your school or at home to avoid using items that are slow to degrade? How might this information affect your purchasing practices?

PURCHASING & PACKAGING

We make choices everyday about the products that we purchase and the type of packaging used to present them. Increases in consumption and packaging mean that the volume of single use or short-life items and packaging waste to landfill is increasing.

Include Statistics: food and drink packaging on the amount of packaging that ends up in landfill.
Stat about waste audit.



Hamam Pics



Key Messages

- As informed consumers we can have a positive impact on the environment by making wise purchasing choices.
- Purchasing practices can take into account the 'embedded/embodied' energy in products. Purchasing locally-produced items conserves the energy used to transport imported items and reduces our environmental impact (eg pollution and climate change).
- Our purchasing practices can take into account the durability, longevity, disposability and recyclability of the materials in the product and its associated packaging.
- Avoid purchasing toxic products. Some products are hazardous and should be disposed of separately (eg solvents, chemicals, detergents).
- Buying in bulk reduces packaging.

Key Words

recycle	landfill	styrofoam	retail
reduce	waste	polystyrene	purchase
reuse	pollution	plastic	package
recover	paper	polymer	consumer
resource	cardboard	hazardous	repair
fresh	product	toxic	energy
disposable	contamination	durability	food miles
audit	conserve	retailer	fast food
take away	producer	marketing	wholesaler
manufacturer	advertising	convenience	maintenance
retail therapy	climate change	image	advertising
throw away society		liquid\paperboard	

Search Words and Phrases

extended producer responsibility
inbuilt obsolescence
product stewardship
throw-away society
food safety standards
use-by-date
airtight containers



Wipe out Waste

Purchasing & Packaging

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	Green purchasing, relating to recycled content, recyclability and creation of waste from excess packaging, is identified as an issue for the school	Investigating packaging and purchasing practices and developing green purchasing policies and action plans	Implementing green purchasing principles and practices across the school community	Green purchasing practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Waste issues re purchasing and packaging are raised / identified by staff, students and/or community School governing council informed and involved Consultation occurring with admin, grounds and cleaning staff . 	Collecting baseline data on current practices and sharing with whole school community by: <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site Developing, documenting and promoting whole-school: <ul style="list-style-type: none"> vision, principles, action plans set % waste reduction targets and timelines for action policies and strategies . 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies . 	<ul style="list-style-type: none"> Green purchasing is incorporated into all school policies and plans Outcomes are documented, promoted and acknowledged Green purchasing has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement. .
Management Systems	<ul style="list-style-type: none"> Understanding that management systems can include types of products purchased schools can reduce costs with waste minimisation programs . 	<ul style="list-style-type: none"> Auditing of materials purchased at site Assessing systems and procedures Researching options for improvement . 	<ul style="list-style-type: none"> Engaging external service providers to support green purchasing initiatives . 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieving and exceeded .
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring purchasing / packaging issues . 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about 'green' purchasing best fits Auditing materials purchased at site . 	<ul style="list-style-type: none"> Exploring / investigating green purchasing in the curriculum / through integrated learning programs Learning outcomes demonstrate improved understanding and actions for positive change . 	<ul style="list-style-type: none"> 'Green' purchasing is integrated across the curriculum .
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered . 	<ul style="list-style-type: none"> Identifying relevant community resources and support . 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers . 	<ul style="list-style-type: none"> Best practices are modelled for the wider community Students share their learning through actions at home and with the wider community Student participation on community and environmental forums is supported .

Green purchasing in the rubric refers to purchasing which creates less waste, identifies recycled content and recyclability of materials and packaging.



Suggested Learning Activities

Early / Primary Years

Reuse supermarket catalogues to make a collage that illustrates the types of packaging that can and can't be reused or recycled. Collate findings to show the proportion of packaging that will go to landfill. Discuss the implications for your school (eg canteen) and at home.

Tell a story about what happens to a used school lunch order bag. Create different endings based on whether it becomes litter or is placed in a rubbish or recycling bin. Which ending/s are best for the environment and your school?

Select a packaged item that your family buys from the supermarket for school lunches or recess (eg potato chips, confectionery, cheese and biscuits). Compare the cost, weight and volume then compare 'value for money' of a small individual item with a larger bulk pack. Explain the option that saves money, resources or time. Calculate the potential savings over one year if you purchase in bulk. How might this information help with your school lunch purchasing practices?

Record and tally all the packaging in your class's lunch boxes, including lunches purchased from the canteen. Design a lunch box for your favourite school lunch items that requires no additional packaging. Compare the cost of disposable and re-usable lunch box packaging. Implement a plan to reduce the amount of packaging in your class lunch boxes. Record and graph your results. Promote a 'waste-free' food day in your school. Promote your achievements to the school community.

Examine and compare the features of containers made from plastic, paper, liquid paper board, aluminium, steel and glass. Use the internet to investigate how they are made and report your findings. How could this influence canteen purchases in your school?

Make recess snacks such as muesli bars or biscuits at school. Compare the cost and amount of packaging for the ingredients with that of individually wrapped bars or biscuits. Discuss 'economies of scale' in relation to ingredients required and volumes consumed. Conduct a taste test in the school and report the results (including recipes) to the whole school community.

Design an environmentally sound form of packaging suitable for transporting a large fragile item (eg garden gnome) interstate or overseas. What will you need to consider, how can you test the success, what may need modification, what have you learnt about packaging? Share your results.

Collect samples of different types of packaging for use in the following activities:

- Sort by shape, size, number of sides, etc.
- Use everyday language to compare different properties eg size, weight, shape, capacity and materials
- Use boxes to explore 'nets' and create 3D packages of various proportions
- Explain the characteristics of different packaging materials that help to contain the contents and keep them safe or fresh.
- Record information such as where the product was packaged and if it can be recycled.
- Did you find examples of over-packaging (eg food, toys and clothes)? Why do you think companies use packaging to help market their products? Describe the types and features of packaging that attract you to a product.
- What purchasing practices can you rethink to become a sustainable shopper?



Suggested Learning Activities

Middle / Senior Years

Research the types, costs, disposal and recyclability of food packaging sold in your school canteen, local deli or a take away food outlet. Identify the most environmentally sustainable options. Make recommendations can you make to these organisations?

Explore the product packaging of school lunch items available from your canteen or local shop and report on the following:

- the natural resources used to produce the packaging
- can it be recycled and is it?
- the amount and necessity of packaging
- financial and environmental benefits of buying in bulk

How will this affect your purchasing choices?

Report your findings and recommendations to the whole school community, particularly parents and canteen manager/s.

Describe the suitability of different materials for beverage containers. Compare the design of a range of drink containers and conduct experiments to test their strength, durability and porosity. Research one of the following and present your findings:

- South Australia's container deposit legislation
- The National Packaging Covenant
- Government legislation about packaging and marketing beverages eg pre-mixed alcoholic drinks

Investigate purchasing and recycling practices of home economics, administration and cleaning staff with particular reference to origin/source of the items, bulk purchasing, and the amount and type of packaging. Specific items may include:

- Stationary (does paper have recycled content, is it bought in bulk?)
- Toilet paper/hand towels (does paper have recycled content is it bought in bulk?)
- Polystyrene packaging (eg from computers. Is packaging returned to suppliers for reuse or recycling?)

- Packaging which uses materials that are difficult to recycle eg cling wrap, packing tape, polystyrene.
- Health and safety aspects of different types of packaging.

Report your findings to appropriate staff/school body and negotiate any necessary changes to improve current practices.

Investigate the chemical composition, recyclability and degradability of different types of plastic. Conduct a series of tests to determine the physical properties and suitability for particular purposes of different types of plastic packaging. Report your findings. How might this information affect your purchasing practices?

Investigate transport costs of imported products. Are similar products available locally? What factors influence trading decisions? How can consumer purchasing practices influence political and commercial trade decisions?

Compare the durability of reused items with a similar new item. How might this influence your purchasing practices?

Examine products purchased within the school to determine if recycled options are feasible. Investigate the availability and price of recycled products suitable for use in schools. Are they cost comparable to the nearest equivalent school items purchased? Report your findings to school management.

ORGANICS

Food and Garden material / waste

Over 30% of the household waste in South Australia is organic material derived from food and garden waste.

South Australia currently (2005) produces over half a million tonnes of organic waste per year. 30% of this is garden organics and the other 70% is timber, timber packaging, wood/sawdust, and bark from tree thinnings. (Zero Waste SA)

Organic (once living) material can be composted. Food and garden material contribute significantly to the waste stream and much of this material could be used in compost.

'Composting is the process by which waste organic materials are broken down over a period of weeks or months. In composting, this material is converted to a dark rich-coloured product, humus, which can then be spread on or dug into the garden.' (ZWSA Fact Sheet; Composting and mulching)

There are opportunities for schools to compost and reduce the large amount of food and garden waste/material going to landfill and to involve the composting process in learning opportunities, including enterprise education programs.



Wipe out Waste

Organics - Garden

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	'Green' organics identified as an issue for the school	Investigating green organics management practices and developing green organics policies and action plans	Implementing green organics management principles and practices across the school community	Green organics management practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Green organics is raised / identified as an issue by staff, students and/or community School governing council informed and involved Consultation occurring with admin, grounds and cleaning staff . 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> vision, principles, action plans set % waste reduction targets and timelines for action policies and strategies . 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies . 	<ul style="list-style-type: none"> Green organics management is incorporated in school policies and plans Outcomes are documented, promoted and acknowledged Green organics management has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement .
Management Systems	<p>Understanding that:</p> <ul style="list-style-type: none"> 'green' organic material is a valuable resource schools can reduce costs with waste minimisation practices . 	<ul style="list-style-type: none"> Auditing green organics streams at site Assessing systems and procedures Researching options for improvement . 	<ul style="list-style-type: none"> Engaging external service providers to support green organics management initiatives . 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded .
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring green organics issues . 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about 'green' organics best fits Exploring / investigating green organics in the curriculum Auditing green organics streams at site . 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change . 	<ul style="list-style-type: none"> Green organics management is integrated across the curriculum .
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered . 	<ul style="list-style-type: none"> Identifying relevant community resources and support . 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers to support initiatives . 	<ul style="list-style-type: none"> Best practices are modelled for the wider community Students share their learning through actions at home and with the wider community Student participation on community and environmental forums is supported .

The term 'Green Organics' is used to describe organic (plant) material from gardens, ovals and lawns. Green organic material is not necessarily green in colour, but is commonly a recognised term (at time of print).

Organics - Food

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	Food waste identified as an issue for the school	Investigating food waste management practices and developing food waste policies and action plans	Implementing food waste reduction and recycling principles and practices across the school community	Food waste management practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Food waste is identified as an issue by staff, students and/or community School governing council informed and involved Consultation occurring with admin, grounds and cleaning staff . 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing food waste streams at site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> vision, principles, action plans set % waste reduction targets and timelines for action policies and strategies . 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies . 	<ul style="list-style-type: none"> Food waste reduction and recycling is incorporated into school policies and plans Outcomes are documented, promoted and acknowledged Food waste reduction and recycling has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement .
Management Systems	<p>Understanding that;</p> <ul style="list-style-type: none"> food is a valuable resource waste reduction can bring cost savings . 	<ul style="list-style-type: none"> Auditing food waste streams at site Assessing systems and procedures Researching options for improvement . 	<ul style="list-style-type: none"> Engaging external service providers to support food waste reduction and recycling initiatives . 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded .
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring food waste issues . 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about food waste issues and management best fits Auditing food waste streams at site Exploring / Investigating systems for managing food waste: composting, worm composting, school gardens . 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change . 	<ul style="list-style-type: none"> Food waste reduction and recycling is integrated across the curriculum .
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered . 	<ul style="list-style-type: none"> Identifying relevant community support e.g. council, parents, hardware stores . 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers . 	<ul style="list-style-type: none"> Best practices are modelled for the wider community Students share their learning through actions at home and with the wider community Student participation on community and environmental forums is supported .



Wipe out Waste

Key Messages

- Humans depend on healthy soil to grow food. Healthy soil requires the presence and cycling of organic materials. Composting is a valuable part of the nutrient cycle and returns valuable nutrients to ecosystems.
- Organic (plant and animal) materials are those that can be recycled by nature's living systems.
- Composting food and garden material/waste is an effective form of resource recovery which produces a valuable end product.
- Organic waste in landfill decays anaerobically (starved of oxygen) and produces methane, a greenhouse gas that contributes to climate change.
- Composting allows humans to cooperate with ecosystems rather than disrupt them when disposing of waste.
- The compost industry is a growth sector providing employment opportunities for South Australians.

Key Words

recycle	worm	soil	caterpillar	habitat	retention
mini-beasts	reduce	fungi	web of life	millipede	organic
leaves	invertebrate	food	beneficial	life cycle	centipede
virus	moisture	insects	organisms	fertiliser	ecosystem
grow	oxygen	water	springtails	bacteria	mould
ant	waste	acidic	horticulture	slug	conditioner
plants	beetle	landfill	mulch	natural	snail
aerobic	animals	earthworm	micro-organism	reproduce	resources
compost	anaerobic	harmful	leach	microbes	herbivore
castings	decompose	neutral	sustainable	breed	odour
yields	slater	rot	ecosystem	methane	permaculture
nutrient	manure	flies	smell	humus	greenhouse
environment	aerate	food web	vermiculture		

Search Words and Phrases

compost systems	biobin
worm farm	bokashi
permaculture	sustainable communities
vermiculture	community gardens
organic waste	soil nutrients
organic gardens	natural fertilisers

Suggested Learning Activities

Early / Primary Years

Design a method to measure the amount of organic waste created at your school. How will you use this information and share it with the whole school community?

Collect food scraps from school lunches, record and bury them in the school garden. Predict what will happen to them over time. Uncover once a week and record observations. Discuss whether this is an effective way of composting food waste at school.

Design a method for collecting and composting food scraps and explain how this will help to reduce the total amount of waste produced at your school. Develop guidelines, with helpful hints, for managing a successful school composting system. Create posters to show what kinds of food scraps can be put into a compost/worm compost system and a 'how to' brochure that includes safety measures. Communicate your proposals to reduce waste to the whole school community.

Research the types of animals and insects you may find in compost. Investigate their life cycle and habitat needs and draw food chains / webs. How do these animals help breakdown the organic matter?

Related activities include:

- Describe observable changes to a variety of materials placed in a compost bin
- Identify and list living and non-living things in a compost bin
- Display specimens and create compost critter identification and information cards
- Use a hand lens / microscope to identify body parts of compost creatures and describe how the body parts work together. Discuss camouflage in compost animals and how this might help them to survive
- Sort and classify compost creatures into groups according to various criteria including: number of legs; wings or no wings; antennae or no antennae; size; colour; shape; food source
- Make a simple compost creature showing basic body parts (eg worm – saddle, segments)

Display your creatures and food chains/webs in the school foyer.

Design an experiment to compare the decomposition rates of food scraps that your school is composting. Compare composting rates of the food with and without soil. Considering the results of your experiment, what action will you take to improve composting in your school?

Investigate worm diets and habitat to determine what types and quantities of worms are suited to worm composting. Relate this to composting daily food waste in the worm composting system at your school. What enterprise opportunities does your worm composting offer you?

Research opportunities for organic waste recycling at or near your school (eg food materials/waste, prunings, sawdust/wood shavings). What local options exist? How can the school access them? Report on these options to the school community.



Suggested Learning Activities

Middle / Senior Years

Investigate how much food is wasted from your school. Discuss the range of issues associated with food waste. Suggest ways of reducing this amount. Arrange a time to discuss your findings and recommendations with the Canteen Manager or Parent Committee and agree on appropriate action to reduce the amount of food waste.

Monitor the amount of organic material in your school. Research different types of composting systems, comparing their benefits and disadvantages in a school setting.

- Design a composting system for your school and enlist support from the community (e.g. parent help, council support, business donation of materials. If your school generates lots of large garden material, could some of this be shredded or chipped for mulch?
- If you already have a composting system, how would you improve the management of the system?
- Develop a campaign to inform the school community about your system.

Research the science of a compost system (eg the role of bacteria, the suitability of worm composting, aerobic / anaerobic processes). How will this research assist you to manage a compost system in your school?

Develop a flow chart to illustrate the transfer and transformation of material and energy through a food web in a compost or worm compost system. Display near your school compost or worm compost system.

Design an experiment to compare the success of plants grown in humus (finished compost), worm castings and normal soil. Discuss the results of your composting experiments and how can this information be used in the school? Report your findings and recommendations to the school community.

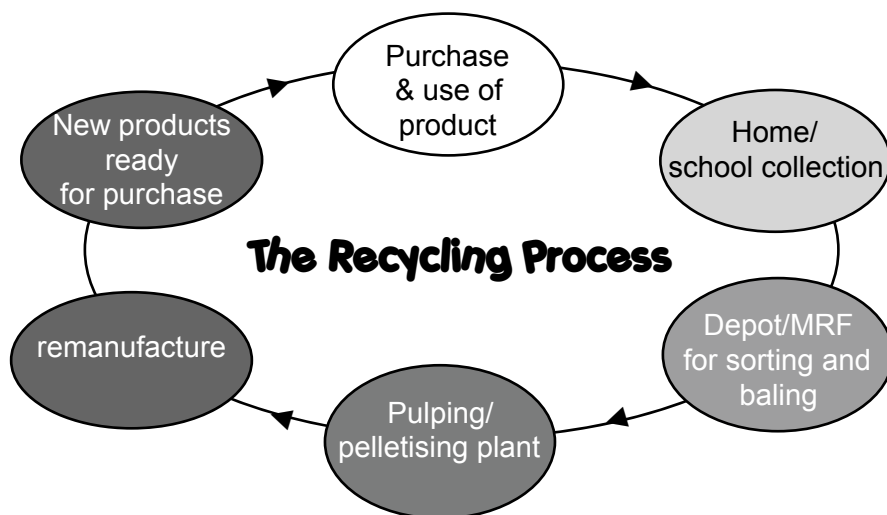
Explain the role of macro and micro-organisms in converting green waste into nutrient-rich soil. Test factors which affect decomposition of organic material in a compost system. Relate this to your school composting system to improve the efficiency.

Investigate the local compost industry to find out which products are being produced, their uses and employment opportunities. What relationships could exist between this industry and your school?

Research the suitability of invasive or noxious weeds for composting and any measures that you might take to prevent the spread of these weeds through composted material. How might this information affect your composting practices?

Recycling

Recycling involves the collection, transport and reprocessing of materials into new products. Recycling can involve many different stages, and materials may travel interstate or overseas as part of the recycling process.



Statistics: awaiting Zero Waste



Wipe out Waste

Solid Recycling

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	Purchase of goods with recycled content and recovery of recyclables are identified as issues for the school	Investigating the flow of recyclables and their management. Developing policies and action plans	Implementing recycling principles & practices across the school community	Recycling practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Recycling issues are raised / identified by staff, students and/or community School governing council informed and involved Consultation occurring with staff, admin, canteen, grounds, parents, students and cleaning staff 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> Vision, principles, action plans targets and timelines for action policies and strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies 	<ul style="list-style-type: none"> Recycling is incorporated into school policies and plans Outcomes are documented, promoted and acknowledged Recycling has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement.
Management Systems	<p>Understanding that:</p> <ul style="list-style-type: none"> Recyclables are a major contributor to school waste streams Significant cost savings can be made with recycling Recycling can generate funds for school 	<ul style="list-style-type: none"> Auditing recyclables streams at site Assessing systems and procedures Researching options for improvement 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Engaging external service providers to support p/c reduction, re-use and recycling initiatives 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring recycling issues 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about recycling best fits Exploring / investigating recyclables / recycling of waste streams in the curriculum Auditing recyclables streams at site 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change 	<ul style="list-style-type: none"> Recycling is integrated across the curriculum
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered 	<ul style="list-style-type: none"> Identifying relevant community resources and support 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers 	<ul style="list-style-type: none"> Students share their learning through actions in the wider community Best practices are modelled for the wider community

Recycling - 5c Containers (CDL)

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	CDL containers identified as an issue for the school	Investigating CDL container management practices and developing policies and action plans	Implementing CDL container collection principles and practices across the school community	CDL container management practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> CDL container collection is raised / identified as an issue by staff, students and/or community School governing council informed and involved Consultation occurring with canteen, grounds staff, parents, students and cleaning staff 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing waste streams at site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> vision, principles, action plans targets and timelines for action policies and strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies 	<ul style="list-style-type: none"> CDL container collection is incorporated in school policies and plans Outcomes are documented, promoted and acknowledged CDL container collection has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement
Management Systems	<ul style="list-style-type: none"> Understanding that collection of CDL containers can save resources and generate funds for school 	<ul style="list-style-type: none"> Auditing CDL container streams at site Assessing systems and procedures Researching options for improvement 	<ul style="list-style-type: none"> Engaging external service providers to support CDL container collection initiatives 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring CDL container issues 	<ul style="list-style-type: none"> Reviewing curriculum framework to identify where learning about CDL best fits Auditing CDL container streams at site 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and actions for positive change 	<ul style="list-style-type: none"> CDL container collection is integrated across the curriculum
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered 	<ul style="list-style-type: none"> Identifying relevant community resources and support 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders/ external service providers to support CDL container collection initiatives 	<ul style="list-style-type: none"> Best practices are modelled for the wider community Students share their learning through actions at home and with the wider community Student participation on community and environmental forums is supported

CDL - Container deposit legislation



Wipe out Waste

Key Messages

- We can all recycle. It is easy with the right system in place!
- Purchasing items with recycled content is essential in the recycling process.
- Recycling conserves valuable resources and energy, preserves land and wildlife habitat, decreases water and air pollution and saves money. Recycling contributes to sustainable resource use.
- Recycling saves money and provides opportunities for fundraising and earning rewards through incentive programs.
- In SA, between 70-90% of beverage containers with a 5c deposit are recycled, providing some of the best material for recycling in the world.
- Recycling conserves raw materials and saves materials from being sent to landfill, but requires energy for the recycling process.
- Recycling redirects resources that may otherwise be considered waste (to appropriate new uses).

Key Words

recycle	landfill	closed-loop	glass	reprocess	toner
paper	reduce	waste	sustainable	aluminium	avoid
open-loop	cardboard	reuse	cartridge	conserve	liquid
pollution	mining	steel recover	paper board	redirect	container
kerbside	extraction	plastic	audit	organics	natural resource
resource	contamination	e-waste	manufacture	survey	compost
			recyclable	recyclability	council

Search Words and Phrases

container deposit legislation
 resource recovery
 material recovery facility
 kerbside collection
 design for recycling
 open/closed loop recycling



Suggested Learning Activities

Early / Primary Years

Locate information from a range of sources about recycling options in your community. Contact your local council for information about where different materials go to be recycled and the processes involved. Develop promotional materials to encourage the school community to recycle.

Determine the number of 5c (CDL) deposit drink containers in your school. Design, construct and appraise bins or bags suitable for the collection of these containers and implement an effective system for managing 5c container collection.

Decide how the funds raised will be used (eg equipment, events, charity or overseas aid). Monitor and promote your collection program.

Produce a TV show, radio commercial, brochure or powerpoint presentation about recycling for the whole school community. Include information about the benefits of recycling, slogans and helpful hints.

Create a poster to identify items at school or home that can be recycled or a storyboard to explain the life cycle of a recycled item (eg aluminium can, PET bottle, steel can, glass jar or carton). Include how your school recycles and why it is important.

Identify recycling symbols on packages and investigate the plastic identification number system. Compare the properties of different types of plastic. Why is it important to understand this system and how will it affect your school recycling?

Make your own recycled paper or recycled paper products. Write a procedure for the process. Develop a school enterprise project, using hand made recycled paper products.

Explain the difference between reusing and recycling giving examples of each to demonstrate your understanding. Which do you think is better for the environment and why? To what extent are these practices used in the school and how can they be improved?

Prepare a report describing the processes involved in producing one of the following:

- ▼ plastic from petroleum
- ▼ glass from sand, soda ash and lime
- ▼ aluminium from bauxite
- ▼ paper from wood
- ▼ steel from coal and iron ore

What recycled products are made from this material in Australia and/or overseas? Are these recycled items available for use in your school?

Map the location of recycle bins, compost buckets and main collection points in your school and prepare a calendar and roster for managing these systems. Make suggestions for improving the system after monitoring for a period of time.

Select a recycled paper product (e.g. toilet paper or copier paper). Check labels for product information, or contact the manufacturer, to find out how it is made and the percentages of virgin and recycled paper fibre used. Investigate the products your school uses. Are they the most environmentally friendly you can use?



Suggested Learning Activities

Middle / Senior Years

Conduct a Paper/Cardboard Audit or Survey to identify the following:

- ▼ Paper/cardboard use and waste (likely to include canteen, staff/administration areas, classrooms)
- ▼ the quantities in these locations
- ▼ recycling practices and collection facilities

Design, promote and implement a plan to reduce paper use and recycle paper/cardboard in your school.

Investigate school waste items that can, and are, collected for recycling by local businesses or council. Conduct a Bin Survey to map the location of recycling bins/boxes in the school. Discuss your findings and make recommendations for improving school waste management policies and systems. Consider strategies such as painting and/or labelling recycle bins, creating posters and education campaigns to reduce contamination of recycling collections.

Compare renewable and non-renewable resources and explain the role of recycling in conserving these. Investigate the energy used (including transport) to produce a product made from recycled material compared with a similar/identical product made from virgin material/resources. Does the purchase price reflect the energy/transport costs? Examine products purchased within the school to determine if recycled options (eg stationery and toilet paper) are feasible.

Distinguish between 'closed-loop' recycling and 'open-loop' recycling. Explore some of the issues associated with recycling (eg collection system, contamination, lack of markets, cost). Report on any business support and incentives provided by government to promote increased recycling. Which businesses/industries in your area would benefit from these opportunities?

Investigate 'Design for Recycling' (DfR) principles used in the manufacture of large items (eg cars and furniture). Design a functional everyday item that can be easily disassembled for recycling. How could this be developed into a school enterprise opportunity?

Research the environmental, social and financial costs and benefits of recycling e-waste, compared to disposing of it in landfill. Who do you believe should be responsible for these costs? (ie buyer, distributor or manufacturer). What factors do you consider in deciding whether to recycle or send a product to landfill, and why? How can consumers be encouraged to act in a sustainable way?

Research innovations which enable materials diverted from landfill to be used in new ways (eg alternative fuels, oil recovery, demolition materials). Include your findings in a brochure for the local community.

Litter

Litter is a persistent environmental issue around the world. In Australia, local councils and State governments spend hundreds of thousands of dollars on litter clean ups, stormwater pollution prevention, removal of illegally dumped materials and education initiatives. Litter is unsightly and creates health and safety problems, but the biggest concern is the damage it can cause to land and marine environments and the potentially lethal effect it has on wildlife.

It is important to remember that 'littering' (the deliberate disposal of rubbish in an inappropriate way) is a chosen behaviour. Control measures, such as regular clean ups,

designated eating areas and banning certain items in the schoolyard are useful litter control measures, but are a reaction to litter and not to littering.

Effective litter education programs develop understandings about the negative and positive impacts of our choices and actions on the environment.

This together with a whole school commitment to waste minimisation promotes positive attitudes and behaviours that reduce littering.

Key Messages

- Litter is waste material that has not been disposed of in the most appropriate manner.
- Effective waste management systems will help to reduce litter.
- We all have a responsibility to protect the environment by reducing litter pollution.

Key Words

pollution	rubbish	odour	vermin
reduce	disposal	smell	take-away
recycle	regulations	health	disposable
packaging	finest	safety	contamination
toxic	responsibility	precautions	consumer
waste	prevention	flies	consumption
landfill	impacts	insects	danger
environment	inputs	outputs	aesthetics
audit	hotspots	hazard	Illegal
dumping	aesthetic	attitude	consequences
wildlife habitat	fast-food	convenience	

Search Words and Phrases

throw-away society
litter reduction strategies
stormwater pollution
clean up
illegal dumping



Wipe out Waste

Litter

Level of Achievement ▶	Beginning	Planning and Developing	Implementing	Achieving
Overarching actions ▶	Litter identified as an issue for the school	Investigating litter prevention principles and practices and developing action plans	Implementing litter prevention policies and practices across the school community	Litter prevention practices are successfully embedded in learning, decision-making and operations throughout the school community
Area ▼	Indicators			
Whole School	<ul style="list-style-type: none"> Litter issues raised by staff, students and/or community School governing council is informed and involved Consultation occurring with admin, canteen, grounds and cleaning staff and parents 	<p>Collecting baseline data on current practices and sharing with whole school community by:</p> <ul style="list-style-type: none"> surveying school community attitudes and behaviours auditing litter on site <p>Developing, documenting and promoting whole-school:</p> <ul style="list-style-type: none"> vision, principles, action plans targets and timelines policies and strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements Evaluating outcomes and adjusting policies, targets and strategies 	<ul style="list-style-type: none"> Litter prevention is incorporated in school policies and plans Outcomes are documented, promoted and acknowledged Litter prevention has become part of school culture Student participation in decision-making is supported Ongoing monitoring and evaluation to ensure continuous improvement.
Management Systems	<ul style="list-style-type: none"> Understanding that reducing litter in schools can save time, money and improve sense of school pride and ownership 	<ul style="list-style-type: none"> Auditing litter and assessing bin management systems Assessing current strategies and options for improvement eg eating times /areas, 'clean up' strategies 	<ul style="list-style-type: none"> Monitoring, recording and promoting achievements 	<ul style="list-style-type: none"> Regular evaluation occurs to ensure continuous improvement Targets are achieved and exceeded
Curriculum / Learning	<ul style="list-style-type: none"> Classes are exploring litter issues through learning rather than behaviour management programs 	<ul style="list-style-type: none"> Curriculum audit of where learning relating to litter issues currently (or potentially) fits in your curriculum planning Exploring litter prevention through integrated learning programs in preference to behaviour management programs Auditing litter and assessing bin management system 	<ul style="list-style-type: none"> Learning outcomes demonstrate improved understanding and positive attitudes to litter prevention 	<ul style="list-style-type: none"> The value of litter prevention is part of school culture and is integrated across the curriculum
Community	<ul style="list-style-type: none"> Community is informed Community support is gathered 	<ul style="list-style-type: none"> Identifying relevant community resources and support 	<ul style="list-style-type: none"> Involving and engaging local community stakeholders / external service providers 	<ul style="list-style-type: none"> Students share their learning through actions in the wider community Best practices are modelled for the wider community

Suggested Learning Activities

Early / Primary Years

Generate a list of common litter items in your school yard and discuss the following:

- ▼ Whose responsibility is it to clean up these items or prevent littering?
- ▼ Does litter create health or safety problems for humans?
- ▼ What can happen to these items if they are not picked up?
- ▼ How might they be dangerous to wildlife?
- ▼ Can any of these items be recycled?
- ▼ How would you educate other students about the impacts of litter?

Conduct a Bin Survey in the school to determine the following:

- ▼ location (in relation to litter hotspots)
- ▼ design
- ▼ visibility
- ▼ collection schedule
- ▼ insect/odour issues
- ▼ all users in and out of school hours

Make recommendations for possible improvements.

Analyse litter items to determine what percentage is waste, recyclable, organic and 5c CDL containers. Consider providing separate bins for recyclables, 5c CDL containers, food scraps that can be composted and general rubbish. How will you communicate your recommendations to the school community and educate them in their correct use?

Consider a no bin day/week for all students and staff. Everyone must carry their waste and collect it to analyse the source of waste, then take waste and uneaten food home. Record whether waste packaging is generated from home or in school.

List 10 excuses people might use for littering. Create pictures to illustrate 'litter bug' actions and consequences.

Organise a 'waste-free' food day. Design flyers to advertise the event and offer ideas for reducing lunch box waste. Conduct lunchbox waste surveys before and during your event and compare the amount and type of waste generated each day. Set goals for continued improvements.

Write a short story, play, song or poem to describe how you feel about litter and what you can do to avoid littering.

Design litter awareness posters for display around your school and/or community. Demonstrate the impact of littering on the environment from an animal's point of view.



Suggested Learning Activities

Middle/Senior Years

Discuss the statement, 'Prevention is better than Cure' and review your school's current litter strategies/practices. Are they about control or prevention? What changes might you suggest to current practices?

Conduct a Litter Audit / Survey to identify the following:

- ▼ extent of littering in the school
- ▼ areas of the school that are most affected / littered
- ▼ composition and types of school litter, quantified into categories
- ▼ sources of the school litter (whether canteen, home or a combination).
- ▼ people's reasons for littering.

Design, promote, implement and monitor a campaign in the school to reduce litter.

Litter from your school grounds, and surrounding areas, can be blown and washed into stormwater drains. Investigate the local stormwater system and catchment area to identify where your school litter goes. Prepare a school assembly presentation explaining the impact of litter on freshwater or marine environments and actions the whole school community can take to prevent litter.

Research local and State government litter prevention strategies and regulations, including:

- ▼ stormwater pollution control/management
- ▼ owner responsibility for dog/animal droppings
- ▼ fines and enforcement
- ▼ cleanup costs

Comment on the effectiveness of these strategies and how they might be improved?

Forward suggestions to appropriate authorities.

Prepare a report about local and national litter statistics, available from:

KESAB

www.kesab.asn.au/litterstats/index.htm

Clean up Australia Day

www.cleanup.org.au/rubbishreport/

Keep Australia Beautiful

www.kab.org.au/nat_li/default.htm

- ▼ Summarise data (eg most common types, places where people litter)
- ▼ Compare State and National statistics and changes over time
- ▼ Explain how this data is collected and comment on its usefulness
- ▼ Present data using tables, charts and diagrams
- ▼ Identify and analyse trends

Hypothesise about these trends and make recommendations for improvements in your school and local community.

Conduct a social research project (attitudinal study) about littering in your school. Survey students and staff to gather information about the following:

- ▼ attitudes and behaviours related to littering and waste management
- ▼ opinions about current litter reduction strategies in the school, particularly whose responsibility it is to reduce litter
- ▼ strategies for dealing with people who litter

Prepare a report for the school council which summarises your findings and makes recommendations for future strategies.

Cultural • Historical • Futures Perspectives

Waste and waste management practices have changed dramatically in Australia and other countries over a relatively short period of time.

Throughout human history, social groups have lived in close proximity to the resources they relied upon for survival. Before the Industrial Revolution, most products were made from natural materials, creating waste that would decompose relatively easily.

Since this time, changing consumption patterns, technology and values regarding natural resource use and the environment, have influenced waste generation and waste management practices.

Key Messages

- We can learn from the experiences of others and have a responsibility to change our practices to reduce waste in the future.
- Waste issues and practices vary between different cultural groups.
- Waste practices in Australia have changed dramatically in a relatively short time.
- Social trends, consumption patterns and technology affect the nature and quantity of waste.
- Future waste practices can be influenced by understanding how values and behaviour are formed and how they influence social trends.

'When I was young I never wasted, otherwise straight away I get trouble. Even bone not wasted. Make soup or burn that bone...

I look after my country... We got to look after, can't waste anything...

If you waste anything now, next year...you can't get as much because you already waste...

This earth... I never damage. I look after...'
Australia's Kakadu Man Bill Neidjie
(Co-author of Australia's
Kakadu Man, 1985)

Search Words and Phrases

tradition	environment
making do	ecological footprint
technological change	cradle - to - grave
industrial revolution	consumption
appropriate technology	needs
human settlements	wants
technology	values
hazardous	ethics
citizens	toxic
indigenous	
eco-footprint	
extended producer responsibility	
sustainable development	
climate change	
pre-consumer responsibility	
post-consumer responsibility	
appropriate / alternative technology	
product stewardship	



Wipe out Waste

Key Words

refuse	reuse	reduce	recycle	rethink
society	future	disposal	waste	change
possibility	disposable	community	suburb	opportunity
resourcefulness	growth	management	responsibility	manufacture
technology	industrialisation	convenience	life-style	generation
historically	development	production	consumption	innovation
values	capitalism	consumerism	ethics	eco-footprint
cradle to grave	toxic	technology	hazardous	citizens
indigenous	eco-footprint	environment	greenhouse	needs
ecological footprint	values	wants	ecological footprint	
product stewardship		tradition	'making do'	
extended producer responsibility		alternative technology		

Suggested Learning Activities

Early / Primary Years

Discuss 'needs' and 'wants'. What do we need to survive? What things do we get because we want them? How might needs and wants differ between cultural groups? What can you learn from this?

Interview older family and / or community members about what waste disposal was like when they were at school. Ask them to recall burning or burying rubbish, trips to the rubbish dump and the 'garbos'. Describe how things have changed and consider the reasons why. Develop a timeline and suggest how your learning will influence future waste management at home or in your school.

Imagine what it would be like for your school to be waste free. Work out ways that this could happen. What role can you play in helping your school become waste free?

'Use it up
Wear it out
Make it do
Or do without'

What does this mean? How does this relate to you at home and / or school? Give an example. Create your own ditty and decide how to use it to encourage people at home and school to reduce waste.

Historically, indigenous cultures used natural resources very efficiently and all waste (excepting shell or stone items) was degradable. Consider the consequences of introducing non-degradable plastic products such as plastic bags or disposable nappies into a society that previously hasn't used these products? What changes may need to be made to waste management systems to account for this change?

Read the quote above from Bill Neidjie. Some cultures may regard the current modern practice of burying unwanted items in landfill as wasteful. How do practices in your school and home ensure that an item is used to its full potential?

Find a local council waste guide / brochure for residents and discuss how you would find this information if you were a non-English speaking person? Develop and test a brochure about waste in the community for someone from a particular cultural group in your school community, or a similar brochure without text that could be understood by someone of any age or language other than English (LOTE).

Consider how current actions will impact on future generations. Write letters from the present to grandchildren in the future, describing how you, (student) as responsible citizen, have actively contributed to improving waste management for future generations. Read these letters at home.

Suggested Learning Activities

Middle / Senior Years

Research the history of waste / rubbish in Australia with reference to the practices of indigenous Australians, early European settlers and modern Australians. Create a timeline to indicate significant changes in waste in Australia and display to the whole school community. Interview members of the school and local community and make predictions about the next 10 to 20 years.

Identify and analyse several environmental or health problems caused by the disposal of hazardous or toxic substances. How have waste disposal practices changed in relation to OHS&W for workers in the waste industry? Is this consistent at a global level? What OHS&W practices relate to the handling and disposal of hazardous substances (eg chemicals, solvents, detergents) in your school?

Investigate changes in human consumption patterns and waste disposal over time, and identify factors that have contributed to these changes. How can your actions and those of your family and school assist in positive change for the future?

Investigate the increasing use of plastics in vehicles, computers, products from cheap import shops and the environmental impact of this trend. Discuss how social and technological trends, including the ability to meet wants and needs, influence the type and number of products manufactured? Share your findings at home.

Discuss why some products are now made from materials that differ from those used in the past. Investigate and report on the relationship between the current use and future availability of resources. Predict what kinds of materials may be used to make products in the future.

Locate information from a range of sources about recycling in your local area and where different materials are recycled. Research the path of a recyclable item as far as you can and explore distance travelled, processes undertaken and workers involved. Identify local employment opportunities in the recycling industry .

Consider the rights of future generations, and whether current practices will mean the next generation inherits more or less sustainable waste management practices than those of today? Identify key factors that will play a role in the future of waste, and how school communities and individuals can influence these to work towards sustainable futures.





Wipe out Waste

Topic/Concept:

Eco School

Curriculum & Suggested Activities Framework for R-7

Andy Coleman - Belair Schools

Term	Yearly Activities	R-2	3-5	6-7	Comment
1	February World Wetland Day Catchment Tours-KESAB (T/D) March- Clean Up Australia Day March Snapshot no 1	Watercare- The Water Cycle, pond study. Energy- How we use Energy, safety issues "Saving Hieronymous" (video) Materials- What is Recycling? Transport Walking safely to school, road awareness	Watercare- Making rain clouds/ water soaks, Catchment – What is a catchment? Stormwater Energy- Use in the home and school (posters) Energy Saving Materials- Clean Up Australia Day, Plastic facts Transport	Watercare- The mighty Raindrop Water audits Murray Darling Basin Energy- Fossil fuels and renewable resources Saving Hieronymous Materials Impacts of litter, Landfill issues. Plastic bags Transport	
2	KESAB Gutter Guardians June 5 - World Environment Day June 20 - Arbor Day June WaterWatch Snapshot no 2	Biodiversity- Plants, leaves and structure Gardens Worms and creatures underground Materials- Recycling at home and school, composting	Biodiversity- Plants and Transpiration Materials- Paper making, School Recycling Cleaning products Energy- The Greenhouse (video- "Saving Hieronymous")	Biodiversity- Introduced species (feral) vs Indigenous species Watercare Field studies – wetlands, macro invertebrates Energy- Future energy types(technology) Models Action statements, present and future	



Term	Yearly Activities	R-2	3-5	6-7	Comment
3	August16 Snapshot no 4 September- Biodiversity Month National Tree Day Threatened Species Day September National Aquatic Snapshot no5	Watercare- seasons Biodiversity- Australia Fauna and their habitats Energy- Natural energy, wind, water, sun Transport Bike safety, simple road rules	Biodiversity- Threatened species Marine life and habitats Watercare- Storage systems, lakes, reservoirs Reticulation systems Materials- Composting, Recycling, Product Survey of the school canteen.	Biodiversity- Interrelationships, ecosystems Australia Climatic and zones and their Biodiversity e.g. deserts, tropical, coastal, grasslands and urban areas Materials- Recycling, products and consumerism. Natural resource management (forests, oceans, land) Field trip to Statewide Recycling.	
4	October– Snapshot no 6 National Water Week Weed Busters Nov- December – Coast Care week Ocean Care Day Frog Census	Watercare- Stormwater Rivers, streams and wetlands Field trip Biodiversity- simple food chains and ecosystems	Watercare- Water cycle and our local catchment Mapping our local waterways from source to sea. Field trip Energy- Energy design and technology. E.g. insulation, star ratings, wattage	Watercare- Catchment management, Estuarine an coastal environment Underground water Energy- audits and surveys Agenda 21 issues Global climates Actions for our future Biodiversity- Aboriginal heritage past and present relationships	
Eco School Management Task	* all classes monitor: # Nominated classes coordinate management	* Compost, energy, white paper, yard cleaning, drink cartons # Energy, school landcare, composting	* Compost, energy, white paper, yard cleaning, drink cartons. # white paper, energy, drink cartons,	* Compost, energy, white paper, yard cleaning, drink cartons # yard cleaning, energy, drink cartons, newsprint, special projects, Kids' Congress	

Andy Coleman - Belair Schools



Topic/Concept:

Eco School Tasks

Area	Term1/2 Person responsible	Term3/4 Person responsible	Manager for 2006 (contact person)
Staff Kitchen (Recycling Bins)			
Energy Management			
Compost			
White Paper Collecting			
White Paper Collecting Office / NIT areas			
Yard Cleaning and Garden Club			
Drink Containers			
School Landcare			
Environmental Display Boards			
Special Projects and events			
Kids' Congress for Catchment Care (Student Voice)			
Cleaning Products			
Watercare			



Topic/Concept:

Sustainable Resource Use in Schools

Waste & Litter

for Primary Years

Jim Richmond for McLaren Vale Primary, 2002

Learning Area: Society & Environment

Band: Primary

Strand: Place, Space & Environment

Time: Term 4

Context

This unit encourages students to look closely at the waste that they create each day at school by using resources. They investigate the amount of waste that is created in the school. They explore how trialling activities or processes such as recycling, composting or worm farming could better use these resources as well as a better waste system to decrease the amount of litter in the yard and surrounds.

Key Ideas:

- Students examine natural and social environments in local and global communities, analysing patterns, systems and relationships.
- Students use a range of resources and technologies to gain and present information. They develop mapping and graphing skills to represent observable features in the environment.
- Students consider sustainability and care of resources and places as they explore how people's attitudes and values affect their interactions with natural features and cycles.
- Philosophy.....

Leading Towards Outcomes:

- 2.4 Shows and reports on understanding of the interrelationships between natural and built environments, resources and systems.
- 2.5 Uses symbols, maps, models and flow charts to describe the location of places and demonstrate relationships
- 2.6 Understands that people cause changes in natural, built and social environments, and they act together in solving problems to ensure ecological sustainability.

Also consider 1.4, 3.4, 1.5, 3.5, 1.6, 3.6.



Essential Learnings:

Futures

Students:

- understand patterns and connections within systems
- understand world views when analysing future challenges
- reflect on, plan and take action to shape preferred futures
- develop a sense of optimism about their ability to actively contribute to shaping preferred future

Interdependence

Students:

- understand global connections
- understand what is needed for sustainable environments
- act cooperatively to achieve agreed outcomes
- take civic action to benefit the community

Thinking

Students:

- show capabilities in critically evaluating, planning and generating ideas and solutions
- demonstrate enterprising attributes
- use creative and imaginative processes in dealing with contemporary issues
- develop habits of mind that use incisive and critical thinking

Key Competencies

KC1 – collecting, analysing and organising information

KC6 – solving problems

Learning Concepts

Key Ideas

Present school rubbish system and amount of litter in the yard and surrounds is visually unappealing. How can we as a school community objectively reduce the amount of waste the school that goes to landfill?

Learning Activities - **recycling week, litter in grounds, rubbish bins inadequate, waste audit of class / school rubbish, packaging, composting, worm farming, paper recycling, office / class

- Media assessment
- Posters
- Assembly play
- iMovie on digital video
- Litter free lunch day
- Publishing data
- Contact experts eg KESAB, Onkaparinga council
- Visit Southern Waste Depot
- Staff T&D by Onkaparinga council – class talk – EcoAnt visit
- McLaren Vale Recycling depot
- Recycle arrangement with corporate recycling program – printer / fax cartridges

Assessment

Multiple Intelligences contracts – give students opportunity to process the information they have gathered and present this in a number of ways

Long term data so that changes in litter / waste habits can be monitored – greater awareness



Resources

Armstrong, Laffin & Madder, Waste Matters, Gould League Vic. 1993
Energywatch Resource – AGL
Suzuki, David, You Are the Earth, Allen & Unwin
Fein John et al. Teaching for a sustainable world, AAEE

Web Sites: see the WOW website

Current Report

This is a brief summary of what has occurred so far this term:

Processes

Inquiry based action research

Questions / Brainstorm

- What is the problem? Amount of litter in yard. What is waste?
- What effect does this have on the environment? Pollution, resource use, Sustainability, landfill issues, long term
- Why did this happen? Values, society, attitudes, inadequate systems, family, social, knowledge, over-packaging
- What could have been done to prevent this? Current system overhaul, better education & knowledge
- Who is responsible to ensure that this doesn't happen again? Local / Global, taking action, making a difference
- What can we do to help? More knowledge, better systems in place, more equipment, adopt 4 R's.

- ▼ Waste audit has been conducted
- ▼ Yard audit completed
- ▼ Rubbish analysis from bins completed amount / type / quantity etc.
- ▼ Home audits done on packaging etc.
- ▼ Assembly presentation
- ▼ New wheelie bins ordered & positioned
- ▼ Bin lifter purchased & OHS&W issues considered
- ▼ Posters in place
- ▼ Worm farm operating again and instructions for composting have been covered across whole school



Topic/Concept:

Waste Management

Reduce, Reuse, Recycle, Compost

Developed for McLaren Vale Primary school

Learning Area: Society & Environment

Band: Primary

Strand: Place, Space & Environment

Time: Frame: 4 - 6 weeks

Context

This unit encourages students to look closely at the waste that they create each day at school by using resources. They investigate the amount of waste that is created in the school. They explore how trialling activities or processes such as recycling, composting or worm farming could better use these resources

Key Ideas:

- Students examine natural and social environments in local and global communities, analysing patterns, systems and relationships.
- Students use a range of resources and technologies to gain and present information. They develop mapping and graphing skills to represent observable features in the environment.
- Students consider sustainability and care of resources and places as they explore how people's attitudes and values affect their interactions with natural features and cycles.

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Key Competencies

KC1 – collecting, analysing and organising information

KC6 – solving problems

Learning Activities

1. Initial activity

Provide a stimulus picture to create discussion about waste or pollution. A copy of a recent article from the newspaper is useful (especially one that has affected native wildlife). Read or talk about the article or picture.

Clean Up Australia Day or similar type of event or theme

Discussion questions could include:

- What is the problem?
- What effect does this have on the environment?
- Why did this happen?
- What could have been done to prevent this?
- Who is responsible to ensure this doesn't happen again?
- What can we do to help?

Take a walk around the schoolyard (preferably after recess or lunch). Ask students to keep a tally of the amount of rubbish they see around the yard. It may also be useful to also record where the rubbish is seen in the yard.

Discuss the rubbish results:

- How much rubbish is there in the yard?
- Why is it there?
- Where does this rubbish go?

What effect could this rubbish have on the environment - now and in the future?



2. Exploring school litter

- Discuss where rubbish goes if it is put in the bin at school.
- Discuss where the rubbish may end up if it is dropped on the ground.
- Ask students to draw a flow diagram of rubbish (either in the bin or dropped) eg packet of chips from home to school, to bin or yard, to school bin, to rubbish truck, to rubbish dump, to landfill.
- Discuss the places where the rubbish finally ends up in the flow diagrams:
 - What effect does rubbish that ends up in the rubbish tip have on the environment?
 - What effect does rubbish that ends up in the sea or river have on the environment?
 - Which place is best? Why?
 - What would ultimately be the best for the environment? (No / less rubbish!)
 - How can we help to reduce the amount of rubbish that ends up at the tip?
 - What else can be done with the rubbish?

3. Investigating school litter further

Divide the class into smaller groups, each responsible for one section of the schoolyard.

Over a few days the groups will be required to gather rubbish from their area in the yard and record what is found. Headings such as paper, plastic, cans, food and cardboard could be used to help classify the items. Using this information, groups can present to the class the data collected from their area. The use of graphs to present this data is most useful.

Discuss these class findings:

- What is the main source of rubbish at school?
- Why is this?
- In which area is the most rubbish found?
- Why is this?
- Does all this litter need to be put in the bin?
- Are there other uses (eg recycling)?

4. Cooking Up Compost

- Group / sort and label classroom waste
- Investigate schoolyard waste and sort into organic / inorganic
- Conduct a survey to see what percentage of organic materials students place in the classroom bin and household garbage
- Conduct a waste audit in classroom and other classes – compare results
- Visit a landscape gardening business or refuse dump
- Establish a worm farm and monitor / investigate
- Establish a composting system and monitor research results

5. Reduce, Reuse, Recycle!

Divide the class into three (or six) groups. Give each group one of the words: reduce, reuse, recycle. Ask them to write down on a large piece of paper what they know about this concept (eg what it means, what rubbish it refers to, possible options). It is appropriate to also consider diverse cultural views on reducing, reusing and recycling, both over time and globally, and compare them to our current views.

Share these ideas and add more through a class discussion.

Using the data collected from the school rubbish survey, analyse how much of this rubbish could be reduced, reused or recycled.

Design large posters to illustrate the litter items that could be reduced, reused or recycled.



6. Investigating other school waste sources

As a class, brainstorm other areas in the school where rubbish is created (eg office, canteen, classroom, library). Conduct investigations about the types and amounts of rubbish that are collected each day from other areas of the school (eg office, staff room, classrooms).

Divide the class into small groups with responsibility of visiting one area of the school at the end of the day (before the cleaners!). A notice circulated to all staff in the school about this activity is useful to avoid frequent questions of students who are looking in bins, etc!

Students in these groups collect the data from these investigations over a period of time (minimum of one week) and present the information to the rest of the class using diagrams, charts or graphs. It is interesting to keep comparisons of the days when rubbish was greater than others.

Groups present their information to the rest of the class and identify any common issues or findings and reflect on how they worked as a team.

7. Let's take action!

List on the board all the areas of the school where rubbish was identified, for example:

- yard
- school bins
- classrooms
- office
- staff room
- library
- photocopying room
- areas outside of school eg Graduation Grove, Pedler Creek etc.

Ask students to identify one area they would like to investigate further with other students in the class.

The task is to:

1. Use the collected data to identify the wastage issues in this area
2. Explore how rubbish in this area could be reduced, reused or recycled
3. Decide how others in the school could be made aware of this information
4. Take action to trial one strategy to improve the amount of wastage
5. Record ongoing data to see if this strategy is helping
6. Modify and improve the strategy as required based on the data.

Management of activities between groups is required to avoid repetition of strategies (eg a recycling bin area or compost bin could benefit a few groups).

Groups are required to keep ongoing records about the strategies and data collected. They should be given adequate time in class to work in their groups to plan and action their ideas for this area. Support of these group activities from additional adults (eg SSO or parents) is very beneficial to the project work.

Research on the Internet how other schools in South Australia, Australia and internationally are taking action to reduce the amount of waste in their school.



Assessment

- Students plan and undertake investigations of the school waste.
- Groups take action to implement projects and processes from this understanding.

Ongoing anecdotal records should be kept about students' activities and participation in the group research and projects.

Students themselves could present a self-assessment of their own understandings of what they have learnt and achieved through this activity in the form of a report, project, contract, using multiple intelligences.

**A Year 8 Maths****Waste Survey
Assignment****Julie Sampson for Cornerstone College, 2005**

Your assignment is to collate the data collected at Cornerstone College during the KESAB waste survey and produce a report for the 'Working Towards Sustainability' group.

You have to investigate what the statistics reveal about rubbish and recycling at Cornerstone. Statistics help us answer questions. For example - How much recycling is happening? How much recyclable rubbish is put in the rubbish instead? Could more recycling be done?

Your report must contain the following:

- An introduction to the survey and what your report is about
- A presentation of the data in tables and graphs
- A report of your findings (Minimum of ½ page)
- Appendix - A printout of your spreadsheet of tables and graphs with all formulae and formatting instructions used added by hand (eg. %, totalling columns).

Steps to help prepare your report

1. Make a table of the data. Your data should include a summary of all the results for both rubbish bins and recycling bins. You have only collated one of these. Collect the other set of data from another group.

2. You can extend your research by looking at whether there are any particular patterns around the school. This will involve collating the data and doing some extra tables and graphs. For example is the recycling better in certain parts of the school? This needs to be done for an 'A' grade.

3. Collect the data for the bottle recycling bins from Mrs Sampson.

4. Calculate the percentage calculations relevant to your report by hand, minimum of 5. (There may be more percentages than this.)

5. Prepare tables and graphs on a spreadsheet. Use what you have learnt in ICDL to present your tables and graphs with labels, borders and formatting that makes them easy to read. Tables must have a title, headings for columns, use formulas for calculations for sums and percentages. Graphs must have a title, axes labels, be appropriate types of graphs and have a key.

6. Discussion - To prepare your report consider questions like:

- ▼ What are the results of the survey?

- ▼ How much recycling is happening?
- ▼ How much recyclable rubbish is put in the rubbish instead?
- ▼ Could more recycling be done? What limits recycling?
- ▼ Are there any surprising results? Why do you think this is so?
- ▼ What didn't surprise you?
- ▼ If waste management continued in the same way, what would happen?
- ▼ What doesn't the data tell us? What about rubbish at Cornerstone can't you comment on from the data?
- ▼ If you could do the survey again, or get extra information what information would you collect?

7. Present all your findings in a report to the 'Working Towards Sustainability' group here at Cornerstone. Your report can be in one of the following formats but whichever you choose must include some discussion that presents your findings including answers to Q6 questions. The maths and spreadsheets are required no matter which presentation format you choose. You may need to present them as an appendix.

A. Make a poster showing your results and your recommendations.

B. Write a letter of advice to the 'Working Towards Sustainability' group.

C. Based on your findings, design a better way to manage waste in our school.

D. Write a script for a TV Ad about waste management.



Wipe out Waste

	0 marks	1 mark	2 marks	3 marks	4 marks	5 marks	Result
Data Presentation	No tables or graphs	Tables or graphs missing, no labels or lots of mistakes	Graphs titled and labeled but include mistakes in data or presentation or choice of graph.	Mostly correct but only includes Step 1 or Step 2 has errors.	Maximum marks for correct tables/ graphs fully labelled if only Step 1 completed	Tables labelled correctly & all present including extra investigation of Step 2	/5
Maths Calculations	No Maths, % not done.	Lots of errors in the Maths or parts missing.	Hand-written % not done or errors in other parts	Hand-written % & formula in tables and graphs correct			/3
Discussion of the data Q1.	No discussion presented	Only answers that describe the results.	Some conclusions and answers but errors or incomplete answers	All qns answered including conclusions drawn from the stats. Total answer at least ½ page. Max if only answered Q1	Some conclusions and answers including Step 2 stats. Step 1 stats correctly analysed.	Comparisons between data and good analysis. Must include Step 2 analysis. Total answer at least ½ page.	/5
Presentation criteria for...	POSTER	LETTER	DESIGN	SCRIPT			
Specific criteria for the presentation options (Max 5 marks) Choose ONE only.	Show the tables & graphs incldg required presentation. Include discussion that explains the findings, min 150 words writing. Include title and catchy presentation appropriate for a poster.	Have correct letter structure eg. Address, Dear... Yours ...etc. Include some tables & graphs to emphasize your points, be written in a formal business style, Min 200 words.	Your design will take into account your findings, be logical, affordable and solve some of the problems that showed up in the statistics. Include some tables & graphs to emphasize your points.	The script will run for 30 seconds to 1 minute, include facts from your findings about the problems at Cornerstone and some solutions, needs to be catchy like a TV ad.			/5
Comment					Total		/18



Topic/Concept:

Break It Down Now! Composting Program

Simone Cunningham Year 9 Tatachilla Lutheran College, 2006

Learning Area: Science**Strand:** Living Systems, Earth and Space**Band:** Middle**Yr:** 9**Learning Area: Mathematics****Strand:** Exploring, analysing and modelling data, Number**Band:** Middle**Yr:** 9**Life Systems**

Students develop a shared understanding of the characteristics and behaviour of living things and how they are interrelated and interdependent. They appreciate and report on the place of humans in the earth's ecology, and develop their understanding of, explore future possibilities for, and act to contribute to, sustainable environments.

Students examine the ways organisms reproduce, grow and change over generations. They engage with, and appreciate different positions on, ethical issues such as those associated with ecological sustainability and gene technologies.

Earth and Space

Students investigate, through fieldwork and research, the central importance of the earth's role in sustaining life and how changes impact on life; and understand the interaction of the atmosphere, the oceans and the earth's surface.

Exploring, analysing and modelling data

Students engage with data by formulating and answering questions, and collecting, organising and representing data in order to investigate and understand the world around them.

Students use statistical methods to reduce, analyse and interpret data, while critically evaluating the cultural and social inclusivity of the samples used.

Number

Students recognise relationships within different number concepts in order to make sense of, and represent numerically, a range of community activities and social processes encountered in their lives.

Students use computational tools and strategies, and understand and represent the thinking processes employed in solving problems involving proportions.

Learning Outcomes**Life Systems**

5.5 Interprets and uses information about the structure and function of living systems and their relationship to survival of ecosystems.

5.6 Applies theories and conceptual frameworks associated with evolution, biodiversity, genetics, and the cycling of energy and matter in biological and physiological systems.

Simone Cunningham - Tatachilla Lutheran College



Earth and Space

5.1 Researches and analyses contemporary theories about geological features, such as plate tectonics, and investigates their effects on sustaining life on earth.

Exploring, analysing and modelling data

5.1 Plans experiments and surveys; checks data for inconsistencies; and represents and reports on central tendency and spread of data.

5.2 Displays and summarises data to show location and spread, while interpreting and critiquing collected and published data from a variety of sources and perspectives (describing distributions, and making comparisons, inferences and predictions where appropriate).

Number

5.6 Uses numbers, relationships among numbers and number systems and represents and discusses these understandings with others.

5.8 Uses computational tools and strategies fluently and can estimate appropriately.

Student Outcomes:

At the end of this unit, students will be able to:

- Outline the environmental benefits of composting.
- Identify and outline the advantages / disadvantages of different composting systems for particular users/ environment / situations.
- Identify and outline conditions necessary for the particular composting systems to work.
- Make and use compost to improve the soil quality of a garden area in the school.
- Use sampling to provide a representative picture of soil and worm samples
- Outline carbon and nitrogen levels for a healthy compost and suggest materials to ensure ratio is correct.
- Select and use strategies for improving conditions in a compost bin including:
 - o Testing and manipulating pH levels
 - o Monitoring and manipulating C vs N levels
 - o Monitoring and manipulating moisture and aeration of compost
 - o Monitoring and manipulating decomposition and temperature
- Simplify ratio and use rates and ratio to compare quantities and solve problems associated with compost health in relation to carbon and nitrogen levels.

Essential Learnings:

Identity
Thinking
Interdependence
Futures
Communication

Key Competencies:

KC1
KC2
KC3
KC4
KC5
KC6
KC7

**Teaching and Learning Activities**

Students are probably already aware that disposing of 'rubbish' is a major environmental problem. As landfills around the country grow and reach capacity, recycling becomes increasingly important. However, promotional posters and 'footprint' activities will help to cement this view and spark an interest in this topic.

Other possible starting points:

- Students investigate the amount of food and yard waste produced in our school.
- Make a table of your own waste or that of your family that would be suitable for composting.
- Survey school about lunch waste. Compare and analyse waste that is compostable vs non-compostable.

Students are split into 6 groups and research the three systems we have access to:

- Bokashi
- Worm Farms
- Compost bins

These are then to be presented to the class at the end of Week 1:

1. Create a collage showing appropriate materials for those composting systems
2. How long it takes for 'compost' to be made using this system
3. Conditions necessary for the composting system to work
4. How your system creates the compost.

Each class will set up collection bins for food scraps and other materials suitable for composting to be placed in prominent / suitable locations. Each class will then be allocated a day to collect the bins and sort materials into correct system.

1. Students use a recipe to make a small sample of compost in milk or clear containers. (Use Activities 1-5 from handout 2.1 from "A teaching and learning theme on Mathematics of our Environment", **Waste Less: The Footprints Project**, Waste Wise program of Victoria, p20-21, www.ecorecycle.sustainability.vic.gov.au/resources/documents/Waste_Less.pdf)

2. Record the temperature and decomposition of your compost heap over a period of time. What materials decomposed first?

3. Create a flowchart to show the sequence of decomposition – data to be completed over a period of weeks prior to this activity's completion.

Thinking and Learning Skills**Understanding**

Logical/Mathematical
Verbal/Linguistic

Understanding**Analysing**

Logical/Mathematical
Verbal/Linguistic
Naturalist
Interpersonal

Applying

Body/Kinesthetic
Logical/Mathematical

Understanding**Analysing****Applying**

Logical/Mathematical



Teaching and Learning Activities

Students use sampling to provide a representative picture of soil samples in our school. Collect core soil samples from around the school and from home and then analyse.

Sample Analysis 1

- the pH levels
- colour
- spit test (clay levels)
- area it came from in terms of leaf litter etc

Create a map of the school showing soil quality.

Sample Analysis 2

- Record the number of worms found in the sample and analyse this data to find a representative picture of the larger worm population.
- Calculate the suggested growth of worm populations over a period of time and the potential cost benefits of selling these on (entrepreneurial potential). Then compare this with the growth of worm populations in their own farms.

(Use Activities from handout 3.2 from “A teaching and learning theme on Mathematics of our Environment”, **Waste Less: The Footprints Project**, Waste Wise program of Victoria, p27-28).

At this point students and teachers may wish to create a MI / Blooms grid of activities or issues associated with composting that they can use to refine their unit of work or research.

Students investigate the Carbon and Nitrogen ratios needed for healthy compost in their compost bins. (Use Handout on Library Files and Activity 6 from handout 2.1 from “A teaching and learning theme on Mathematics of our Environment”, **Waste Less: The Footprints Project**, Waste Wise program of Victoria, p21).

Students design and set up experiments to find out how compost can improve soil quality and help plants grow by using their composting system to improve their garden area and keep a journal of the growth in their area. This is to then be compared to the other groups and their systems.

Excursion to Peats Soil to view a commercial composting system.

Assessment Tasks

- Students create an instructional video / DVD / CD ROM or web page for support schools:
 - How to set up the composting system.
 - Environments/situations most suited to this system.
 - Advantages/Disadvantages of the system for users/environment/situations.
 - Trouble shooting for pH levels/pests/collection of materials and keeping for bins, keeping the carbon/nitrogen levels correct.
 - Glossary of terms to be used for their system and composting in general.
- Other possible suggestions to be included:
- Create a composting recipe for others to use.
 - Construct maps of the compost areas showing where tools are kept, layering of compost and procedures.

Understanding

Body/Kinesthetic
Logical/Mathematical
Visual/Spatial
Naturalist
Interpersonal
Intrapersonal

Understanding Analysing

Logical/Mathematical
Visual/Spatial
Body/Kinesthetic
Interpersonal
Intrapersonal
Naturalist

Understanding Analysing

Verbal/Linguistic
Logical/Mathematical

Creating Evaluating

Logical/Mathematical
Visual/Spatial
Verbal/Linguistic
Body/Kinesthetic
Interpersonal
Intrapersonal
Naturalist

Creating Evaluating

Logical/Mathematical
Visual/Spatial
Verbal/Linguistic
Body/Kinesthetic
Interpersonal
Intrapersonal
Naturalist



- Outline the daily and long term care needed for your composting system.
2. Create a gameboard to be used for younger students highlighting the how we do it and why we do it aspects of composting.
 3. Write a report that ranks the composting systems with reasons for their ranking and identify modifications that can be made to the composting system to improve it.

Students collect samples of invertebrates from compost bins and then use Invertebrates of the Compost with associated Bloom's Taxonomy activities to explore these critters further.

Debate topics

Students are split into groups of three and given either the for or against for one of the following or other decided debate topics. Teams research their issue and present their debate using accepted debating techniques.

- Benefits of one system of composting versus another.
- Plant 4 veg patches using the three systems and control area with no compost.
- Living next to a volcano is just not worth it.
- The need for promoting composting in our school outweighs the difficulties associated.

Fertile Questions for Extended Research

- How well do human nutrition concepts apply to compost micro-organisms? For example, will the microbes get a 'sugar high', demonstrated by a quick, high temperature peak when fed sugary foods, compared with a longer but lower peak for more complex carbohydrates?
- Measure the pH of a number of different compost mixes. How does the pH of initial ingredients affect the pH of finished compost?
- Some instructions call for adding lime to increase the pH when compost ingredients are mixed. Other instructions caution against this because it causes a loss of nitrogen. How does adding various amounts of lime to the initial ingredients affect the pH of finished compost?
- Is composting the most viable way of reusing waste?
- What difference can composting really make?
- Worm farms, bokashi or compost bins Is one better than another? Research these forms of composting, considering their benefits & disadvantages, including ease of use, cost, health risk of users, compost richness. What situations would each be most suitable for and why?

Remembering
Understanding
Applying
Analysing
Evaluating
Creating

Creating
Evaluating
Logical/Mathematical
Verbal/Linguistic
Body/Kinesthetic
Interpersonal

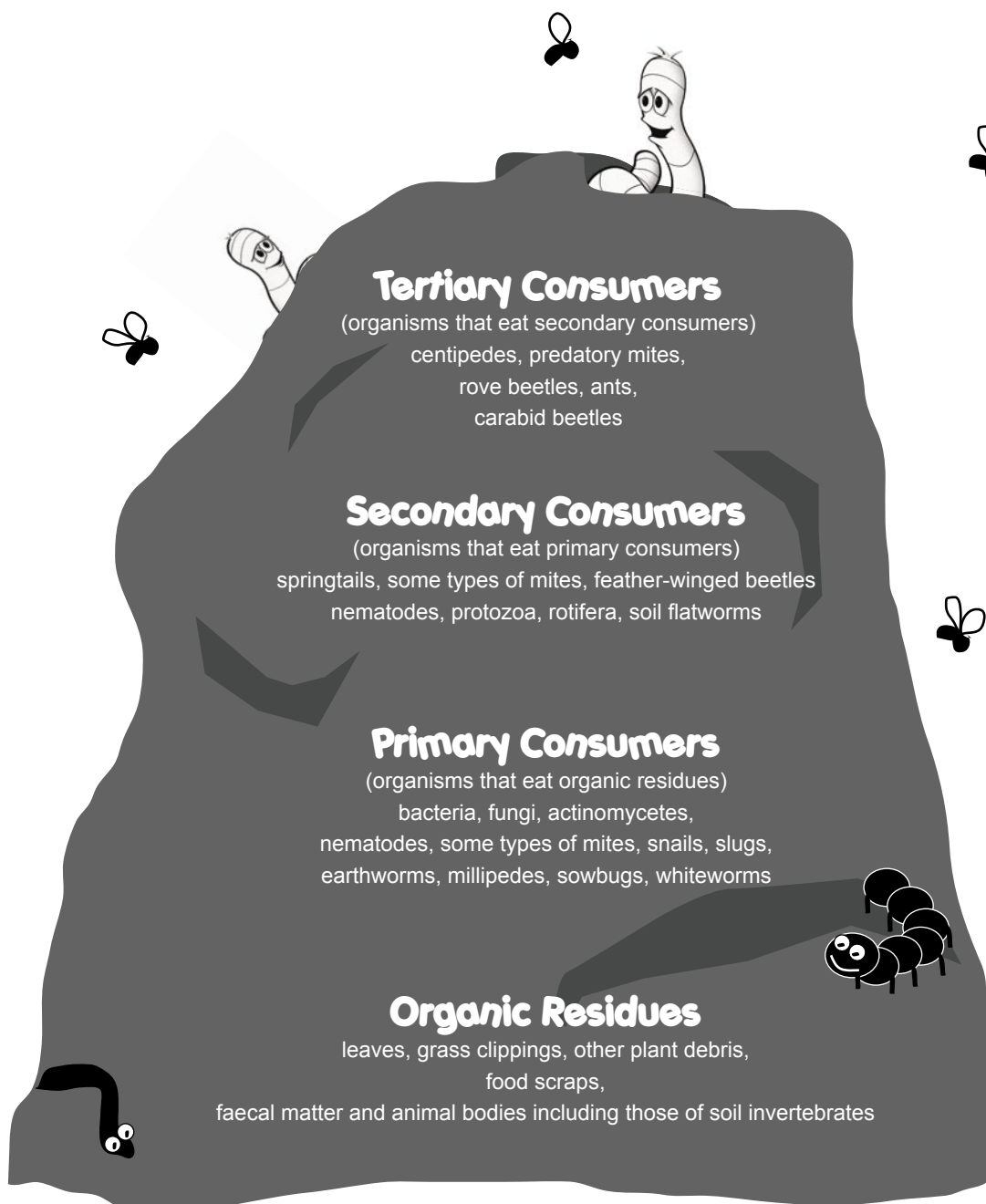
Remembering
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Naturalist



Invertebrates of the Compost Pile

There is a complex food web at work in a compost pile, representing a pyramid with primary, secondary, and tertiary level consumers. The base of the pyramid, or energy source, is made up of organic matter including plant and animal residues.

Source: Cornell Composting





As you can see in the diagram on page 52, organic residues such as leaves or other plant materials are eaten by some types of invertebrates such as millipedes, sow bugs, snails and slugs. These invertebrates shred the plant materials, creating more surface area for action by fungi, bacteria, and actinomycetes (a group of organisms intermediate between bacteria and true fungi), which are in turn eaten by organisms such as mites and springtails. Many kinds of worms, including earthworms, nematodes, red worms and potworms eat decaying vegetation and microbes, and excrete organic compounds that enrich compost. Their tunneling aerates the compost, and their feeding increases the surface area of organic matter for microbes to act upon. As each decomposer dies or excretes, more food is added to the web for other decomposers.

Nematodes: These tiny, cylindrical, often transparent microscopic worms are the most abundant of the physical decomposers - a handful of decaying compost contains several million. It has been estimated that one rotting apple contains 90,000. Under a magnifying lens they resemble fine human hair.

Some species scavenge on decaying vegetation, some feed on bacteria, fungi, protozoa and other nematodes, and some suck the juices of plant roots, especially root vegetables.

Mites: Mites are the second most common invertebrate found in compost. They have eight leg-like jointed appendages. Some can be seen with the naked eye and others are microscopic. Some can be seen hitching rides on the back of other faster moving invertebrates such as sowbugs, millipedes and beetles. Some scavenge on leaves, rotten wood, and other organic debris. Some species eat fungi, yet others are predators and feed on nematodes, eggs, insect larvae and other mites and springtails. Some are both free living and parasitic. One very common compost mite is globular in appearance, with bristling hairs on its back and red-orange in color.

Springtails: Springtails are extremely numerous in compost. They are very small wingless insects and can be distinguished by their ability to jump when disturbed. They run in and around the particles in the compost and have a small spring-like structure under the belly that catapults them into the air when the spring catch is triggered. They chew on decomposing plants, pollen, grains, and fungi. They also eat nematodes and droppings of other arthropods and then meticulously clean themselves after feeding.

Earthworms: Earthworms do the lion's share of the decomposition work among the larger compost organisms. They are constantly tunneling and feeding on dead plants and decaying insects during the daylight hours. Their tunneling aerates the compost and enables water, nutrients and oxygen to filter down. 'As soil or organic matter is passed through an earthworm's digestive system, it is broken up and neutralized by secretions of calcium carbonate from calciferous glands near the worm's gizzard. Once in the gizzard, material is finely ground prior to digestion. Digestive intestinal juices rich in hormones, enzymes, and other fermenting substances continue the breakdown process. The matter passes out of the worm's body in the form of casts, which are the richest and finest quality of all humus material. Fresh casts are markedly higher in bacteria, organic material, and available nitrogen, calcium, magnesium, phosphorus and potassium than soil itself.' (Rodale)

Slugs and snails: Slugs and snails generally feed on living plant material but will attack fresh garbage and plant debris and will therefore appear in the compost heap.

Centipedes: Centipedes are fast moving predators found mostly in the top few inches of the compost heap. They have formidable claws behind their head which possess poison glands that paralyze small red worms, insect larvae, newly hatched earthworms, and arthropods - mainly insects and spiders.

Millipedes: They are slower and more cylindrical than centipedes and have two pairs of appendages on each body segment. They feed mainly on decaying plant tissue but will eat insect carcasses and excrement.

Sow Bugs: Sow Bugs are fat bodied crustaceans with delicate plate-like gills along the lower surface of their abdomens which must be kept moist. They move slowly grazing on decaying vegetation.

Beetles: The most common beetles in compost are the rove beetle, ground beetle and feather-winged beetle. Feather-winged beetles feed on fungal spores, while the larger rove and ground beetles prey on other insects, snails, slugs and other small animals.

Wipe out Waste



Spiders: Spiders feed on insects and other small invertebrates.

Ants: Ants feed on aphid honey-dew, fungi, seeds, sweets, scraps, other insects and sometimes other ants. Compost provides some of these foods and it also provides shelter for nests and hills. Ants may benefit the compost heap by moving minerals around, especially phosphorus and potassium, by bringing fungi and other organisms into their nests.

Flies: During the early stages of the composting process, flies provide ideal airborne transportation for bacteria on their way to the pile. Flies spend their larval phase in compost as maggots, which do not survive thermophilic temperatures. Adults feed upon organic vegetation.

Pseudoscorpions: Pseudoscorpions are predators which seize victims with their visible front claws, then inject poison from glands located at the tips of the claws. Prey include minute nematode worms, mites, larvae, and small earthworms.

Earwigs: Earwigs are large predators, easily seen with the naked eye. They move about quickly. Some are predators. Others feed chiefly on decayed vegetation.

Source: <http://compost.css.cornell.edu/invertebrates.html>

Bloom's Taxonomy	Related Activities
Remembering (Knowledge)	<ul style="list-style-type: none"> • Make a wall chart of the key facts about the complex food web at work in a compost pile. • List the main points of this article. • Make a true or false quiz about the information in this article.
Understanding (Comprehension)	<ul style="list-style-type: none"> • Write a brief outline of the information in this article. • Make predictions or write a story about the day and life of a primary or secondary consumer in the complex food web at work in a compost pile. • Create a dictionary or glossary of terms to define key ideas in the article.
Applying (Application)	<ul style="list-style-type: none"> • Your compost pile appears to be short of secondary and tertiary consumers. Write recommendations to help solve this problem. • Construct a model to show the complex food web at work in a compost pile. • Design a board or card game to teach about the complex food web at work in a compost pile.
Analysing (Analysis)	<ul style="list-style-type: none"> • Analyse your own compost and create a poster showing the organisms you found. • Investigate the life cycle including food web for one of the primary, secondary or tertiary consumers. • Compare the organisms present in your compost over a period of time.
Evaluating (Judgment)	<ul style="list-style-type: none"> • Investigate the potential harms of some of these organisms to humans. Make recommendations on how to keep people working with composts safe. • Make a prioritised list of ingredients to encourage a particular primary, secondary or tertiary consumer to live in your compost
Creating (Synthesis)	<ul style="list-style-type: none"> • Create a poster, song, or media campaign to teach other members of the school about the complex food web at work in a compost pile. • Use the question matrix to devise questions that may be researched.



Bloom's Taxonomy: Six Thinking Levels						
Multiple Intelligencies	Knowing	Understanding	Applying	Analysing	Evaluating	Creating
Verbal I enjoy reading, writing & speaking	List the key aspects of composting OR outline information about the invertebrates found in a compost heap OR materials needed for a healthy compost heap.		Write an Information Report describing the ingredients needed for a compost heap including the carbon-to-nitrogen (C/N) ratio for each of your compost ingredients.	List the advantages/ benefits &/or disadvantages/issues of composting for the following aspects: students; teachers; grounds people; curriculum; finance; environment & school grounds.	Justify the need to promote composting in our school, your home or local community.	Prepare a list of criteria for healthy composting OR write a policy for the school composting program including who is responsible, set-up, daily & long-term maintenance, & rules for users including OH&S.
Mathematical I enjoy working with numbers & science	1. Make a true or false quiz about composting. 2. List the carbon-to-nitrogen (C/N) ratio of different compost ingredients.	1. Predict the temperature &/or decomposition of your compost heap over a period of time. Collect data over this timeframe and then compare predictions. 2. Create a flowchart to show the sequence of decomposition. 3. Create a pyramid diagram of the complex food web at work in a compost pile.	Construct a map of the compost area showing where tools are kept, layering of compost and procedures.	1. Survey school on lunch waste. Compare/ analyse waste that is compostable vs non-compostable. Record results on a graph using excel program. 2. Measure the pH of a number of different compost mixes. Analyse how the pH of initial ingredients affects the pH of finished compost.	1. Using a map of the school, find an appropriate site for a composting site & justify your choice/ reasons. 2. Rank areas in the school in relation to the success of the composting system giving reasons for their rank. 3. Identify modifications that can be made to the composting system to improve it.	1. Create a board game to be used by younger students highlighting the how we do it and why we do it aspects of composting. 2. After analysing the pH of initial ingredients and their effect on the pH of finished compost create a plan of what ingredients to include in the compost pile over the next week/month.



Wipe out Waste

Bloom's Taxonomy: Six Thinking Levels						
Multiple Intelligencies	Knowing	Understanding	Applying	Analysing	Evaluating	Creating
Visual I enjoy painting drawing & visualising	Make a wall chart with diagrams or pictures about an aspect of composting eg correct layering of compost OR invertebrates.	Illustrate a brochure or wall chart on an aspect relating to composting: issues, materials, processes.	Draw a diagram of the compost area showing where tools are kept, layering of compost, processes & procedures.	Use a Venn Diagram to compare two or three different composting techniques.	Create a visual and emotive display to clearly express the importance of composting for our school & environment. Justify your image choices.	Create a brochure or poster promoting composting in our school – highlighting the 'how we do it' and the 'why we do it' aspects of composting.
Kinaesthetic I enjoy doing hands-on activities	Locate and use a recipe to make your own compost in a milk carton or similar container.	1. Cut out words and pictures from magazines to create a collage representing aspects of composting: issues, materials, processes. 2. Predict, then measure, the PH level of initial ingredients used in compost and that of the compost pile.	1. Make a slideshow about an aspect of composting. 2. Construct a model to show how to create a compost heap	Make a slideshow contrasting two or three different composting techniques.	Make recommendations through an oral presentation or PowerPoint presentation or model to improve the current composting system.	1. Create & implement a compost system for your school. Maintenance will be essential. 2. After analysing the pH of initial ingredients and their effect on the pH of finished compost create a plan of what ingredients to include in the compost pile over the next week/month.
Musical I enjoy making & listening to music	Find a poem or song on food waste or composting and recite or perform to the class or small audience.		Write a rap or song to be performed at a school assembly highlighting the how we do it and why we do it aspects of composting.	Create & perform a short radio advertisement on a particular composting technique or a related aspect.	Compare songs or advertising campaigns used in programs for food waste reduction. Rank in order of effectiveness & justify your choices.	

Bloom's Taxonomy: Six Thinking Levels						
Multiple Intelligencies	Knowing	Understanding	Applying	Analysing	Evaluating	Creating
Interpersonal I enjoy working with others	Brainstorm/record with a partner all the aspects of daily & long term care that would be needed for a composting system.	Play the 'Matching Composts' game. This game may have several levels from the ingredients appropriate for composting to levels of carbon or nitrogen in different compost ingredients.	With a friend research another school's composting program and compare with our school.	Work with a partner to examine the issues relating to composting in a school (survey could be used to identify these first). Report these to the class.	1. As a class or small group write letters to members of the school community (principal, school council, parents) explaining why composting is necessary for our school. 2. Class debate analyzing how the composting system is going.	Devise a class or small group presentation to the school council or principal for your composting system &/or for funding the initial setup of composting system.
Intrapersonal I enjoy working by myself	Make a table of your own food waste or that of your family that would be suitable for composting.	Write a letter to the editor of the local paper outlining the issues surrounding the need for composting OR outlining your school's composting program.	Construct a PMI on composting for different areas eg school, home, workplace OR different styles of composting eg Bokashi, Worming	1. Mind Map what you have learnt about composting. 2. Write a journal or story of the journey taken during the composting process of specific ingredients.	Write a letter to members of the school community (principal, school council, parents) explaining why composting is necessary for our school.	Create a composting recipe for others to use.
Naturalist I enjoy working outdoors with plants or animals	Collect autumn leaves, straw, wood chips, newspaper, coffee grinds grass clippings to create a collage of appropriate materials for composting.	Collect autumn leaves, straw, wood chips, newspaper, coffee grinds grass clippings and list their levels of carbon or nitrogen.	Construct aspects of the composting system, including the bins and their placement.	Take and then analyse pH levels of soil in different garden areas in the school. Which are healthy or in need of help?		