

'Recycle Right' Upper Primary Resource Pack

This package includes activities that develop literacy and numeracy skills whilst investigating waste management and sustainability issues. They may need to be adapted to your class's individual requirements.



Year 4

Science: Natural and processed materials have a range of physical properties; these properties can influence their use. (ACSSU074)

- selecting materials for uses based on their properties
- considering how the properties of materials affect the management of waste or can lead to pollution

HASS: The use and management of natural resources and waste, and the different views on how to do this sustainably (ACHASSK090)

- identifying some of the resources produced by the environment and where they come from (for example, water, food and raw materials such as fibres, timber and metals that make the things they use)
- exploring how some natural resources are used and managed in sustainable and non-sustainable ways
- identifying renewable and non-renewable resources
- investigating where a particular renewable natural resource comes from, how it is used and sustainable management strategies (for example, recycling paper or planting more trees)
- exploring the work of groups and organisations which manage natural resources and/or waste

Year 5

HASS: The environmental and human influences on the location and characteristics of a place and the management of spaces within them (ACHASSK113)

- exploring the extent of change in the local environment over time and the impact of change on ecosystems
- investigating a current local planning issue (for example, redevelopment of a site, protection of a unique species), exploring why people have different views on the issue, and developing a class response to it

Year 6

Science: Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting. (ACSSU095)

- exploring how reversible changes can be used to recycle materials



KEY MESSAGES:

Australians are among the highest waste producers in the world. We generate almost 48 million tonnes of rubbish each year – that is about 2.1 tonnes from each of us. Not all of this waste is recycled, with about 40% of waste being sent to landfill or dumped in the environment.¹

Landfill – a problem, not a solution

- **Landfill:** You can only fill a hole in the ground with so much rubbish before it fills up. If we keep creating waste at the current rate, we will run out of suitable disposal sites. Landfills produce a toxic liquid called leachate which is a mixture of organic acids, dissolved chemicals and rainwater which contaminates surrounding land and waterways.
- **Waste of resources:** It takes water, energy and natural resources, such as coal, oil and trees, to make a product. It doesn't make sense for these precious resources to end up in landfill when they could otherwise be reused and recycled
- **Greenhouse gases:** When waste decomposes in landfill it releases carbon dioxide and methane gas. These gases are greenhouse gases and contribute to global warming.
- **Threat to marine life:** Sometimes waste isn't disposed of correctly. Over 6 million tonnes of rubbish is dumped annually in the world's oceans. 80% of this waste is plastic. It is responsible for killing more than one million seabirds and 100 000 mammals each year.²

Recycling:

- Conserves natural resources
- Saves large amounts of water and energy used during production
- Reduces the emission of greenhouse gases
- Reduces the risks to sea life if materials are disposed of properly

1. www.environment.gov.au/system/files/resources/4b666638-1103-490e-bdef-480581a38d93/files/wgrra.pdf

2. www.cleanup.org.au/PDF/au/cua_recycling_fact_sheet.pdf

Useful Resources

Inches, A. (2009). The adventures of an aluminium can. New York: Simon & Schuster.

Inches, A. (2009). The adventures of a plastic bottle. New York: Simon & Schuster.

Dorion, C. (2007). Earth's garbage crisis. New York: World Almanac Library



Tuning In

- **How many uses for (Appendix 1):** Construct a class list entitled “101 ways to use a box” (or plastic bag, etc). Challenge another class to come up with more!
- **Pass a Tin Around:** Each person in group must say what they could do with the tin and then pass it on to the next person.
- **News Reading (Appendix 2):** Each day, students select an environmental article from the newspaper and record each main event of the story using – who, where, when, what, the problem, the consequence and resolution. Present summary to class by orally reading.

Finding out

- **Visit the RRRRC:** For more information on booking a tour of the Regional Resource Recovery Centre in Canning Vale, visit recycleright.wa.gov.au/contact/take-a-tour/
- **Creating questions:** Using the attached KWLH chart (Appendix 3), students brainstorm all the things they think they know about recycling, and then create a list of topics they wonder about. Watch some of the following videos, taking notes about what they’ve learned and amend any previous statements.
 - **Green fingers** – Closing the Loop: <http://recycleright.wa.gov.au/recycleright-green-fingers-tv/>
 - **Green fingers** – Reduce, Reuse, Recycle: <http://recycleright.wa.gov.au/recycleright-green-fingers-tv/>
 - **Green fingers** – Where does my Waste go?: <http://recycleright.wa.gov.au/recycle-right-greenfingers-tv-2014/>
- **How did we get to this point?** Carry out an oral history interview with an elderly person to discover how shopping and packaging have changed over time. Students can create their own questions. Some examples are below.
 - How often did you have to shop? Why?
 - Which products were packaged?
 - Did you grow any of your own food? If so, what and why?
 - How did you store foods?
 - What kinds of things did you recycle?
 - What is the biggest change you have noticed between now and then?
- **Reduce your rubbish pile interactive activity:** Looking at ways you can reduce, reuse and recycle different waste streams and the statistical difference those changes will make. splash.abc.net.au/res/i/L1004/index.html
- **Conduct a Waste Audit:** Use the Waste Wise School’s Waste Audit Toolkit to conduct your own waste audit to find out which bin your school is putting it in: www.wasteauthority.wa.gov.au/publications/waste-wise-audit-toolkit

Sorting Out

Comprehension activity about recycling: <https://www.studyladder.com.au/games/activity/recycling-27745>

Persuade people to Recycle Right: Design a bus advert to convince others to Recycle Right. Students complete a display, skit or newsletter that can be used to teach others about reducing, reusing and recycling. For more ideas, see our advertising activity pack.

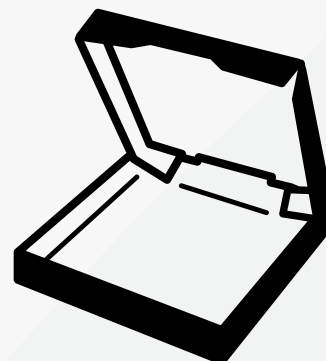
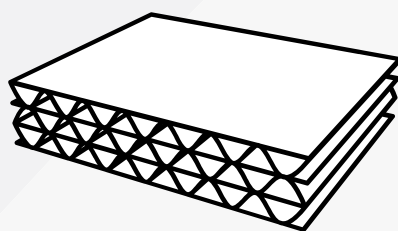
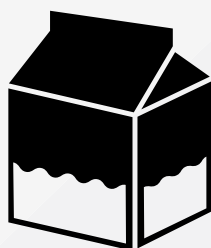
How did we get to this point? Students create a PMI (Pluses, Minuses, Interesting points) chart to review the findings of their interviews about changes that have occurred in packaging. Share this with the class.

Going Further

- **The Life of...:** Read *The Adventures of a Plastic Bottle: A Story about Recycling* or *The Adventures of an Aluminium Can: A Story about Recycling*. Use this information to create a flow diagram of the recycling process for another type of recyclable material.
- **Materials Investigation:** Divide students into groups. Each member researches how a particular item is recycled. Share and compare this information with members of other groups researching the same topic. Prepare a brief report to present back to their group. See our materials properties sheets at the end of this pack.
- **The Physics of Comingled Recycling Separation - Watch the following videos to find out how your recyclables are sorted at a Materials Recovery Facility:**
 - www.abc.net.au/catalyst/stories/2948255.htm
- **Let's make a change:** Design and create a new shopping bag from recycled materials.
- **Watch the video:** splash.abc.net.au/home#!/media/525489/cash-for-cans-in-western-australia
- Then write a persuasive letter to your local member to convince them to lobby for container refunds, to your principal to convince them to establish an aluminium can collection point for your school or an advert to encourage Western Australians to recycle more.

Making Conclusions

- **News Article:** students create their own environmental news article and present to class as a news reader on TV.
- **Materials Investigation:** Groups use the information they found out about their recyclable material to present the recycling process to an audience. They could create a poster, video, skit, comic strip, etc.
- **Rubbish heads:** Have two or three students stand at the board. Each student is labelled as a piece of rubbish and using yes or no answers, they need to figure out what waste they are.



101 Ways to Use A



- | | | |
|-----------|-----------|------------|
| 1. _____ | 35. _____ | 69. _____ |
| 2. _____ | 36. _____ | 70. _____ |
| 3. _____ | 37. _____ | 71. _____ |
| 4. _____ | 38. _____ | 72. _____ |
| 5. _____ | 39. _____ | 73. _____ |
| 6. _____ | 40. _____ | 74. _____ |
| 7. _____ | 41. _____ | 75. _____ |
| 8. _____ | 42. _____ | 76. _____ |
| 9. _____ | 43. _____ | 77. _____ |
| 10. _____ | 44. _____ | 78. _____ |
| 11. _____ | 45. _____ | 79. _____ |
| 12. _____ | 46. _____ | 80. _____ |
| 13. _____ | 47. _____ | 81. _____ |
| 14. _____ | 48. _____ | 82. _____ |
| 15. _____ | 49. _____ | 83. _____ |
| 16. _____ | 50. _____ | 84. _____ |
| 17. _____ | 51. _____ | 85. _____ |
| 18. _____ | 52. _____ | 86. _____ |
| 19. _____ | 53. _____ | 87. _____ |
| 20. _____ | 54. _____ | 88. _____ |
| 21. _____ | 55. _____ | 89. _____ |
| 22. _____ | 56. _____ | 90. _____ |
| 23. _____ | 57. _____ | 91. _____ |
| 24. _____ | 58. _____ | 92. _____ |
| 25. _____ | 59. _____ | 93. _____ |
| 26. _____ | 60. _____ | 94. _____ |
| 27. _____ | 61. _____ | 95. _____ |
| 28. _____ | 62. _____ | 96. _____ |
| 29. _____ | 63. _____ | 97. _____ |
| 30. _____ | 64. _____ | 98. _____ |
| 31. _____ | 65. _____ | 99. _____ |
| 32. _____ | 66. _____ | 100. _____ |
| 33. _____ | 67. _____ | 101. _____ |
| 34. _____ | 68. _____ | |

Reading a Newspaper article

This page will help you understand the main parts of your newspaper article. You will use this information to orally present a summary to your class.

Headline:	
Author:	Dateline:
Who is the article about?	What happened?
Where did it happen?	When did it happen?
Why did it happen?	How did it happen?
What is the problem?	Are there any consequences?
Has the problem been resolved? If so, how? If not, how do you think it can be resolved?	

KWLH Chart: Thinking About Recycling

What I think I Know	What I Want To know	What I have Learned	How I know

For recycling information and useful hints and tips for living more sustainably, visit recycleright.wa.gov.au

How Did We Get To This Point? PMI Chart

After interviewing someone about how they have seen packaging change over time, sort your findings into the table below:

P What are the pluses of packaging changes?	M What are the minuses of packaging changes?	I What are some interesting things about packaging changes?

Amazing Aluminium

Aluminium can be used to make aircraft, automobiles, bicycles, boats, computers, cookware, gutters, siding, wire and of course, cans.

Where does aluminium come from?

Even though aluminium is the most common metal in the Earth's crust, it's not easy to find because it gets mixed up with other elements in a substance called bauxite. The process of extracting aluminium from bauxite is quite complicated and uses a lot of electricity.

Properties and uses of aluminium

Aluminium is a great way to package materials for many reasons.

Aluminium products are very light, weighing three times less than steel, which cuts down on transport costs.

Aluminium does not corrode easily. Aluminium beverage cans have a protective polymer coating applied on the inside to prolong storage life. This polymer coating ensures that the acids and salts in beverages never actually come into contact with the metal.

It can be rolled into extremely thin foil and still keep much of its strength, which adds to its value as a light packaging material because less of it needs to be used.

Aluminium has a melting point of 660°C compared with 1540°C for iron. This is a great benefit for the environment as less energy is required for processing and recycling.

Why recycle?

Aluminium can be recycled over and over forever, and it actually takes 95% less energy to recycle than it would do to extract the raw material. You can recycle all types of aluminium, not just cans! Pie trays, disposable baking trays and even aluminium foil can be recycled in your yellow top bin! By recycling aluminium, we can ensure that it will be available to use for generations to come.

Sources & Extra Links

Cans – how they are recycled:

vimeo.com/7217316

Facts about aluminium cans:

cans.planetark.org/recycling-info/facts.cfm

Aluminium Recycling:

cans.planetark.org/documents/doc-485-aluminium-factsheet-2012.pdf

Waste Wise Schools Aluminium Fact Sheet:

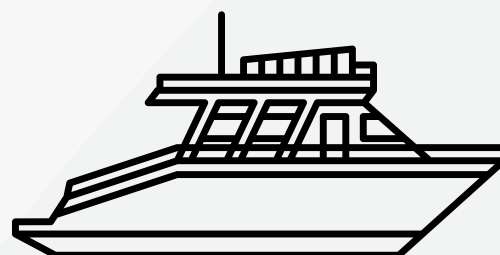
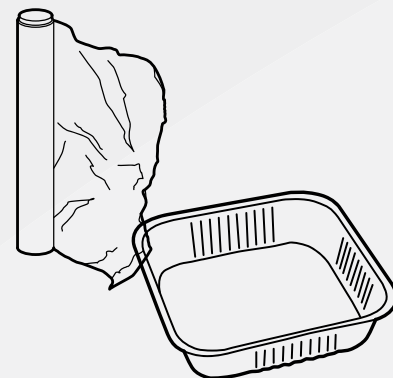
wasteauthority.wa.gov.au/publications/wws-aluminium-factsheet

Steel and aluminium factsheet:

cleanup.org.au/PDF/au/steel-and-aluminium-factsheet.pdf

How it's made – aluminium cans:

youtube.com/watch?v=V4TVDSWuR5E



Stunning Steel

Steel is a material processed from minerals that have been mined from the Earth. It can be used to make vehicles, cables, buildings, tools and cans.

Where does steel come from?

Steel is an alloy of iron and carbon. In order to produce steel, iron and carbon need to be combined, resulting in a metal alloy. This process requires heat, and the electricity required to produce the right conditions is by burning fossil fuels.

Properties and uses of steel

Steel is a conductive material, meaning it transfers heat and electricity easily. This is why it is used to make saucepans and other cookware.

Steel can be shaped and stretched for versatile purposes. It can be rolled into thin sheets.

Steel is strong and durable, so it won't break easily and takes a long time to wear out. Things that need to last a long time, like machines, bridges and building frames are made from steel for this reason.

Why recycle?

By recycling steel, we don't need to dig raw material from the ground and can save energy. Even if new steel is made from recycled steel, it will still be the same quality as if it were made from raw materials. Steel is the world's most recycled material.

Sources & Extra Links

Steel and aluminium factsheet:

cleanup.org.au/PDF/au/steel-and-aluminium-factsheet.pdf

Waste Wise Schools Steel Factsheet:

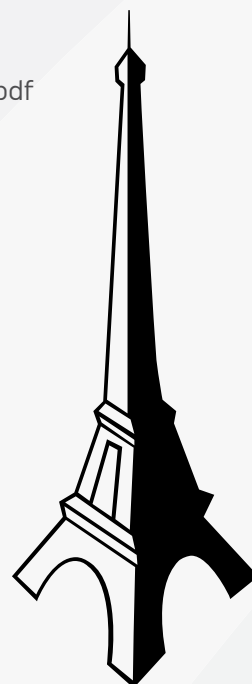
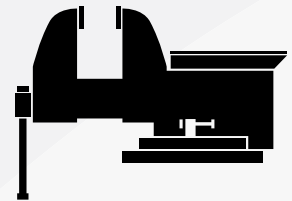
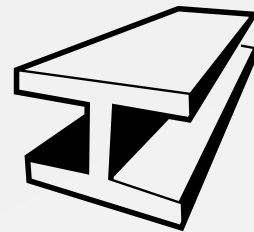
wasteauthority.wa.gov.au/publications/wws-steel-fact-sheet

Properties of Steel:

bluescopesteel.com/media/10530/Properties%20of%20Steel.pdf

HowStuffWorks Show: Episode 12: Ore to Steel:

science.howstuffworks.com/blast-furnace-videos-playlist.htm



Paper

The word paper comes from the Latin word papyrus. Ancient Egyptians, Romans and Greeks used woven reeds from the papyrus plant to make a paper-like material for writing. It was the ancient Chinese that invented the paper making process that is still used today.

Where does paper come from?

Paper is made from the softened cellulose fibre of plants. A mix of plant fibre and water is called paper pulp. Plants such as trees, bamboo, cotton and straw are commonly used to make paper.

Properties and uses of paper

The length of the fibres determines the properties of the paper. Paper products made from long fibred paper will be strong, such as cardboard and plasterboard. Shorter fibres make smoother paper.

Why recycle?

Not only does paper waste in landfill take up space, it also allows greenhouse gases to be released into the atmosphere. Paper can be recycled many times and into many different products. By recycling paper and buying recycled paper products, you are closing the loop and helping reduce waste.

Sources & Extra Links

Paper and Cardboard Factsheet:

cleanup.org.au/PDF/au/cua_paperandcardboard_fact_sheet_final.pdf

Paper Making and Recycling:

epa.gov/osw/conservation/materials/paper/basics/papermaking.htm

Waste Wise Schools – Paper:

wasteauthority.wa.gov.au/media/files/wws/paper-fact-sheet.pdf

All About Paper:

tappi.org/paperu/all_about_paper/paperClips.htm

Properties of Paper:

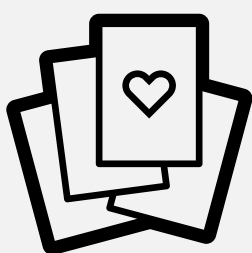
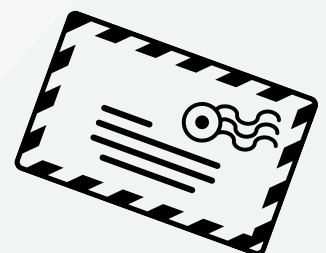
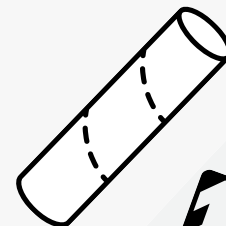
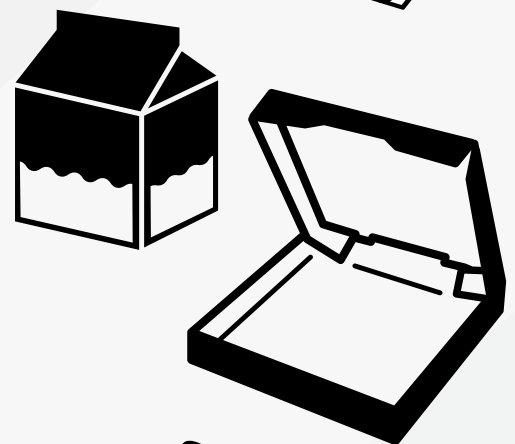
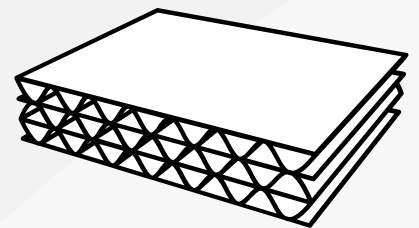
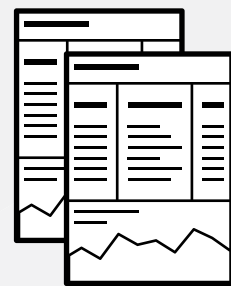
kidcyber.com.au/tag/properties-of-paper/

How do they recycle paper [video]:

youtube.com/watch?v=isEV-mCFPiY

Paper Recycling Game:

splash.abc.net.au/res/i/L15/index.html



Plastic

Plastics are made up from long chain molecules called molecules. There are many different types of plastics with different properties and different uses.

Where does plastic come from?

Plastic is made from fossil fuels such as oil, gas and coal. These resources are non-renewable and will eventually run out. Some plastics are able to be recycled into new plastic products.

Properties and uses of plastic

Plastic is strong but lightweight. Many parts of aeroplanes and cars are made from plastic for this reason.

Hot plastic can be easily shaped. It can be poured into moulds to make toys, buckets or chairs; stretched to make a thread that can be woven into fabrics, like polar fleece jumpers and rain coats; or it can be rolled thin to make plastic bags and cling film.

Plastics are waterproof. This allows them to float easily in water, causing environmental hazards for aquatic animals.

Why recycle?

Plastic takes a very long time to break down naturally and causes problems for many animals who mistake pieces of plastic for food. By recycling plastic we can help these animals. Better still, reduce your use of plastic.

Sources & Extra Links

Plastic Recycling Fact Sheet:

cleanup.org.au/PDF/au/cua_plastic_recycling_fact_sheet.pdf

Waste Wise Schools – Plastic:

wasteauthority.wa.gov.au/media/files/wws/plastic-fact-sheet.pdf

Plastic Facts:

kidcyber.com.au/topics/technology-inventions/plastic/

How is Plastic Made [video]:

kidcyber.com.au/tag/properties-of-paper/

Plastic Game:

splash.abc.net.au/res/i/L32/index.html

