

FULL CYCLE CARDS

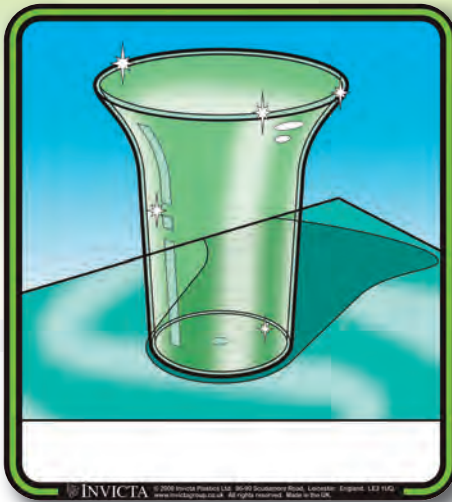


IP 117500 - Full Cycle Cards - Glass
IP 117600 - Full Cycle Cards - Metal
IP 117700 - Full Cycle Cards - Plastics
IP 117800 - Full Cycle Cards - Wood
IP 117900 - Full Cycle Cards - Wool

PRODUCT GUIDE

AVAILABLE FULL CYCLE SETS

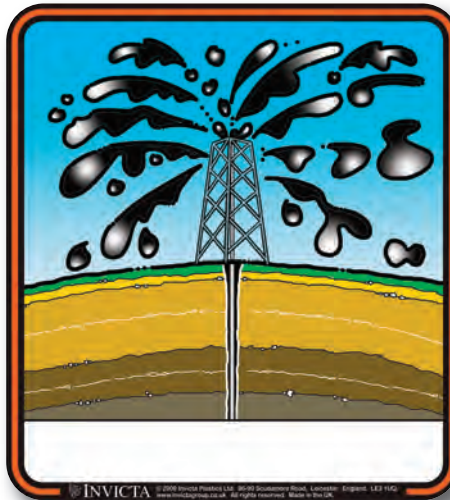
There are currently five sets of Full Cycle Cards available to explain various manufacturing and recycling processes. Click on any set below to view all the cards in that set along with a brief explanation of what is shown on each card.



IP 117500 - GLASS



IP 117600 - METAL



IP 117700 - PLASTICS



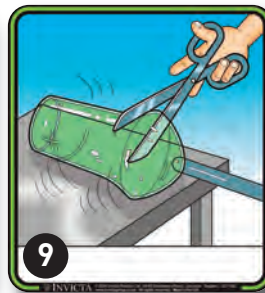
IP 117800 - WOOD



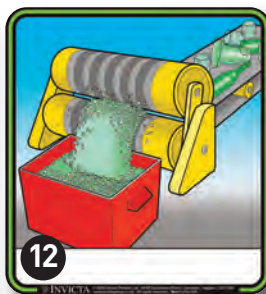
IP 117900 - WOOL



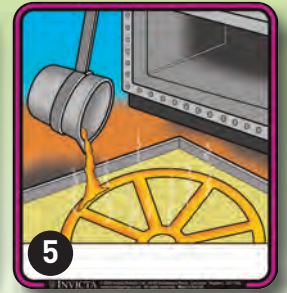
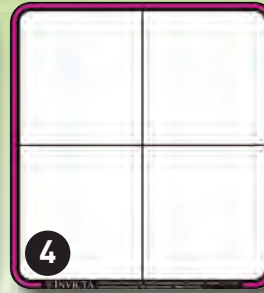
1. The key ingredient in making glass is sand (NATURAL RESOURCE). This can be dredged from the bottom of the sea.
2. The sand is stored, dried and bagged ready to go to the manufacturing plant.
3. The sand is mixed with other ingredients at the manufacturing plant.
4. The mixed sand is heated in a furnace to a very high temperature.
5. When the mixed sand has been heated to the right temperature it changes into molten glass. While it is still molten it can be blown and worked.



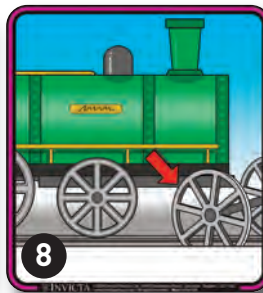
6. Child/Teacher Input. Discuss manufacturing options for the molten glass.
7. Blowing the molten glass forms the shape. This is done by a craftsman using a long blowing tube.
8. The craftsman then rolls and blows the glass into the final shape.
9. Finally the glass is cut away from the blowing tube, finished and left to cool.
10. When the glass has totally cooled, the finished design is ready for use (FINISHED PRODUCT).



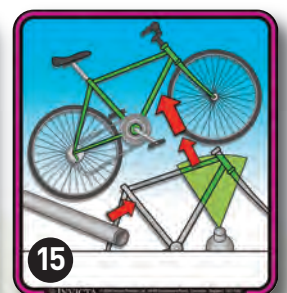
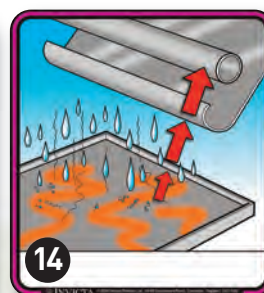
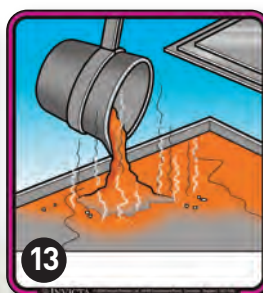
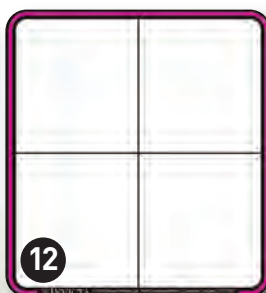
11. Old, used or broken glass can be collected and recycled.
12. The glass is washed and sorted then crushed into fine pieces at a recycling plant.
13. The crushed pieces of glass can then be turned back into molten liquid for re-use.
14. Child/Teacher Input. Discuss recycling options for this molten glass.
15. The molten glass can then be poured into a shape, making the new recycled glass product.



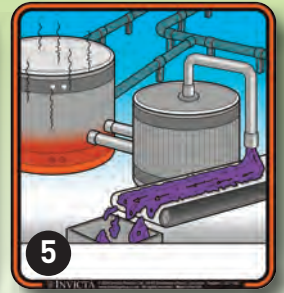
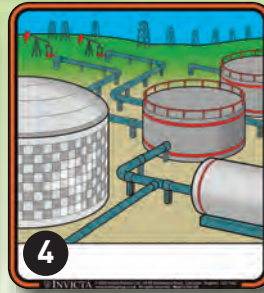
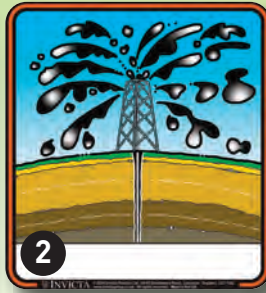
1. Iron ore (NATURAL RESOURCE) is mined from the Earth's crust using machinery.
2. The Iron ore is transported to a manufacturing plant where it is sorted and crushed.
3. The Iron ore is placed into a furnace and heated to a very high temperature (smelting) to produce molten iron. This molten iron can be used to make gates, railings, locomotive wheels, etc. Iron mixed with carbon and then heat treated will make steel, a stronger alloy material used in making tools, knives, cars, machines, etc.
4. Child/Teacher Input. Discuss other manufacturing options for molten iron or steel.
5. The molten iron or steel is poured into a mould, known as 'casting' to make the finished product.



6. The casting is then dipped into water to cool and harden the product.
7. When the product has cooled, it is cleaned and finished off by the craftsmen, ready for use (FINISHED PRODUCT).
8. At the end of its life it can enter the recycling process.
9. Used/Scrap/Waste metals and alloys can be recycled. The metals must be sorted by type at the start of the recycling process.
10. The sorted metal waste is chopped into small pieces.



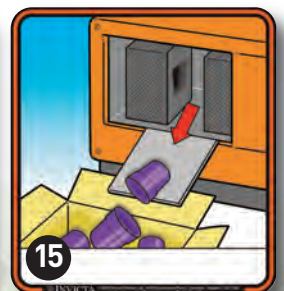
11. The small pieces of metal are heated in a furnace to a very high temperature to turn the metal back into molten liquid form, ready for re-use for the newly molten metal.
12. Child/Teacher Input. Discuss recycling options.
13. The molten metal can be used to make tubes or sheets of metal.
14. The metal is cooled in water before re-use.
15. The metal can be re-used and made into another product.



1. Oil (NATURAL RESOURCE) has to be located underground.
2. Once located, a hole is drilled and an oil rig is set up.
3. Once the oil is flowing, the rig is removed and oil is brought to the surface.
4. The oil is pumped into large tanks at the refinery to refine the oil into different products by separation.
5. Some of these products are heated and additives added in order to produce different grades of plastics for different uses.



6. The raw plastic is made into granules, and bagged up ready to be sent to manufacturers.
7. At the manufacturer the plastic granules are sucked up into moulding machines. The granules are heated to a very high temperature and then injected into a tool inside the machine to make different shapes.
8. Child/Teacher Input. Discuss manufacturing options for the moulded plastic.
9. A tool will be specifically designed for the plastic product required. The tool and moulding machine are opened and the finished plastic product is pushed out and is ready for use (FINISHED PRODUCT).
10. Used and old plastic products can be collected for recycling.



11. Different plastics must be sorted and graded ready for recycling.
12. Sorted Plastics can then be ground into small pieces and bagged for recycling.
13. These small recycled pieces of plastic can now be put into a moulding machine, heated again and re-moulded into a completely new product.
14. Child/Teacher Input. Discuss recycling options – what could be made from this recycled plastic?
15. When the moulding machine is opened, the new recycled plastic product is pushed out and is ready for re-use.



1. To make paper, a tree (NATURAL RESOURCE) is selected, cut down and taken to the saw mill.
2. At the saw mill the tree is cut into logs and then sawn into planks of timber/wood.
3. Child/Teacher Input. Discuss manufacturing options.
4. The off cuts of wood are chipped or ground into small pieces ready for the paper making process.
5. The small chips of wood are added to large water tanks to be washed, treated, soaked and mashed into a pulp to release the fibres in the wood.



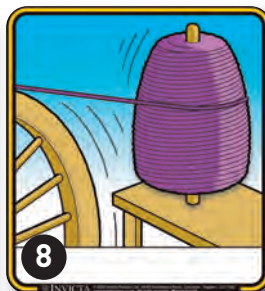
6. The mashed wood pulp is strained through a fine sieve to collect the pulp and drain the water away.
7. When all of the water has drained away and the pulp begins to dry, the fibres within it begin to bond together to form paper, which can be transferred onto a drying mat.
8. When the paper has partially dried it can be peeled away from the drying mat.
9. When completely dry, a brand new sheet of paper remains (FINISHED PRODUCT).
10. The new sheet of paper can be written on, drawn on, used in books, newspapers and many other products.



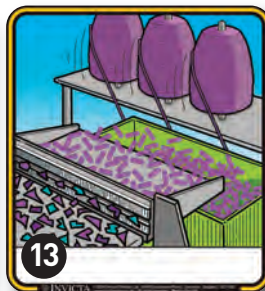
11. Used and waste paper can be recycled.
12. The used/waste paper is collected in large quantities and taken to a paper recycling plant.
13. Recycling at the plant begins with sorting the paper. The paper is washed, treated & soaked in water. It is then mashed into a pulp to release the fibres. The recycled pulp is sieved, dried and then rolled into large rolls ready for re-use.
14. Child/Teacher Input. Discuss uses for recycled product.
15. The recycled paper can be transported and used again in the manufacture of packaging, cardboards, toilet rolls, newspaper and many other items.

N
NATURAL
RESOURCE
R

1. Wool (NATURAL RESOURCE) comes from sheep. They are farmed for their meat and for their wool.
2. The sheep are sheared once a year to collect the wool.
3. The collected wool is known as fleece and is sorted and baled.
4. The wool fleeces have to be washed, scoured and treated in water.
5. Once washed, the wool fleeces can be dyed into many colours.



6. The wool must be completely dried.
7. Child/Teacher Input. Discuss manufacturing options for the dyed wool.
8. The dry wool can be spun into a thin rope which forms the yarn.
9. The yarn can be knitted together by hand or by machine.
10. Knitting the yarn together can create a new warm piece of clothing that can be worn (FINISHED PRODUCT).



11. Old and used clothing can be collected for recycling.
12. The old/used clothing is taken to a recycling plant where it is sorted and cut into small pieces.
13. The small pieces of cloth are shredded into fibres so they can be spun back into yarns.
14. Child/Teacher input. Discuss uses for recycled product.
15. The recycled yarns can then be transported for manufacture and knitted back into different clothes and other fabrics for re-use.

INTRODUCTION

Invicta Education full cycle cards have been designed to get children thinking about common everyday objects, the processes in making them and what happens to them once they have been used. These highly visual card sets are bound to bring about thoughtful discussions and creative thinking.



- The visual nature of the cards and clear simple graphics mean the cards can successfully be used in multi-ability settings.
- Each of the card sets is cross-curricular giving scope for use in multi-disciplinary studies.

Each of the card sets helps children to achieve the learning objectives through a cross-curricular approach. The cards sets are designed for children of all abilities between the ages of 5 – 11 covering subject areas of Science, Geography, Citizenship and PHSE. The suggested activities in this Product Guide show ties to particular areas of study.

HOW THE ACTIVITIES TIE INTO LEARNING OBJECTIVES **Ages 5 - 7**

SCIENCE - Life processes: Illustrates the differences between things that are living and things that have never been alive and allows children to associate various living things to their specific environment – ‘How to care for things’.

SCIENCE - Materials and their properties: Grouping materials allows recognition and naming of common types of material, [for example, metal, plastic, wood, paper, rock] and realise that some of them are found naturally and find out about the uses of a variety of materials [for example, glass, wood, wool].

GEOGRAPHY - Geographical enquiry: Equips the children with skills to express their own views about people, places and environments, [for example, about litter in the school] and communicate in different ways, for example, in pictures, speech or writing. A knowledge and understanding of environmental change and sustainable development is also achieved through the educational aid allowing children to recognise changes in the environment and how the environment may be improved and sustained.

SCIENCE - Materials and their properties: Comparing everyday materials and objects on the basis of their material properties, including hardness, strength, flexibility and magnetic behaviour and to relate these properties to everyday uses of the materials.

GEOGRAPHY - Geographical enquiry and skills: The process allows children to adopt decision-making skills, knowledge and understanding of patterns and processes. The ability to recognise and explain patterns made by individual, physical and human features in the environment and that some physical and human processes can cause changes in places and environments. The knowledge and understanding of environmental change and sustainable development through recognising how people can improve the environment or damage it and recognise how and why people may seek to manage environments sustainably. The educational aid aims to cover a breadth of studies on environmental issues.

WHAT'S IN THE PACK?

Each pack of **FULL CYCLE CARDS** includes;

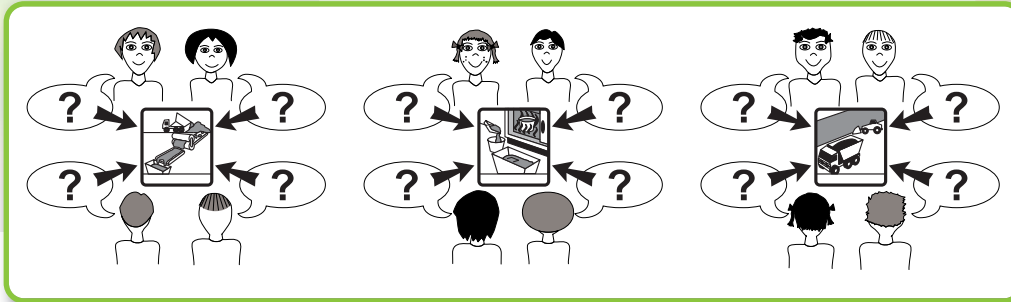
- 13 picture cards each with a dry-wipe writing space at the bottom.
- 2 blank dry-wipe quadrant cards.

Prior to introducing children to the cards for the first time it is a good idea to gauge understanding of materials, many children at this age find it hard to associate a finished product with the Natural Resource it was made from. You may wish to pass around some examples of everyday objects and ask the children if they know what material it was made from. Examples include wooden colouring pencils, fibre tip pens, knitting wool, cotton wool etc.

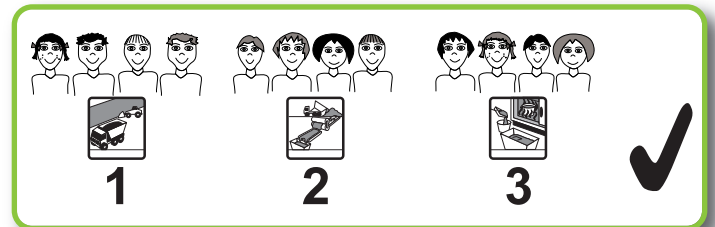
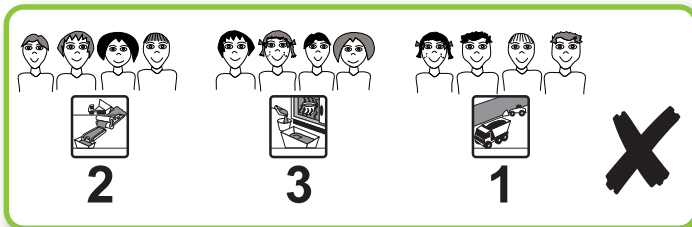
ACTIVITY 1. GETTING A NATURAL RESOURCE READY FOR MANUFACTURING

- Needed for activity:
- 1 of the quadrant cards
 - The first 3-4 Cards depicting a Natural Resource up to point of manufacturing (i.e. in the Metal pack these would be the cards depicting the truck & digger, the ore being crushed and the ore being smelted)
 - Dry-wipe marker (not provided)

Time needed: 30 - 45 minutes allowing for discussion



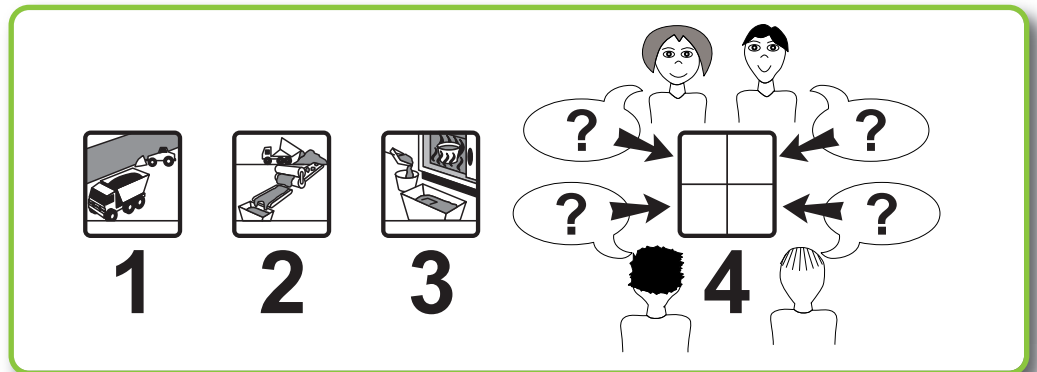
Divide the children into 3 or 4 groups depending on how many picture cards you are using and give each group a card. Ask each group in turn to describe what is on their card and then ask the groups to arrange themselves in the correct order.



Once the children have got into what they believe is the correct order ask them to explain the order. Display the cards in the correct order where everyone can see them and ask the children to explain the process shown on each card. Write the correct process on each card in the space provided with a dry-wipe marker.

Next to the last card place the quadrant card. Ask the children for suggestions on what items could be made from the un-processed Natural Resource shown on the previous card.

Either draw or write good suggestions on the quadrant card using a dry-wipe marker.



Save the completed quadrant card for Activity 2.

ACTIVITY 2. RESOURCE TREASURE HUNT

- Needed for activity:
- You may wish to place items relevant to the particular Natural Resources being explored around the classroom beforehand
 - 4 picture cards from last activity (8 for plastics)
 - Quadrant card from previous activity filled in with childrens' suggestions

Time needed: 15 - 30 minutes allowing for discussion

Ask the children to find objects within the room and name the resource they are made from.



Activity variations

To vary the activity you could make labels showing either the name of the Natural Resource i.e. wood or a drawing of it to place on the objects the children find.

Other variations include asking children to sort small objects into groups based on the resource they are made from or asking the children to find objects made from only a single resource i.e. wood.

ACTIVITY 3. A FINISHED PRODUCT

- Needed for activity:
- First 5-6 manufacturing (8 for Plastics) and Finished Product cards (depending on card pack)
 - 2 quadrant cards
 - Dry-wipe marker (not provided)

Time needed: 15 - 30 minutes allowing for discussion

Repeat the steps for Activity 1 this time giving the children the Finished Product cards and asking them for suggestions about what could happen to the product once it has been used and put into the waste.

Add these suggestions to one of the quadrant cards. Suggestions might include recycled, landfill etc.



Discuss how products can be recycled and how this can help the environment and put the cards between the Finished Product card and the second quadrant card in the correct order. Ask the children for suggestions on what items could be made from the recycled product.

Either draw or write good suggestions on the quadrant card.

ACTIVITY 4. A NEW LIFE

- Needed for activity:
- Natural Resource cards and Finished Product cards from at least two different **FULL CYCLE CARD** packs
 - Selection of recycled items placed around the room for children to find (i.e. pencils, leaflets and exercise books made from recycled paper)

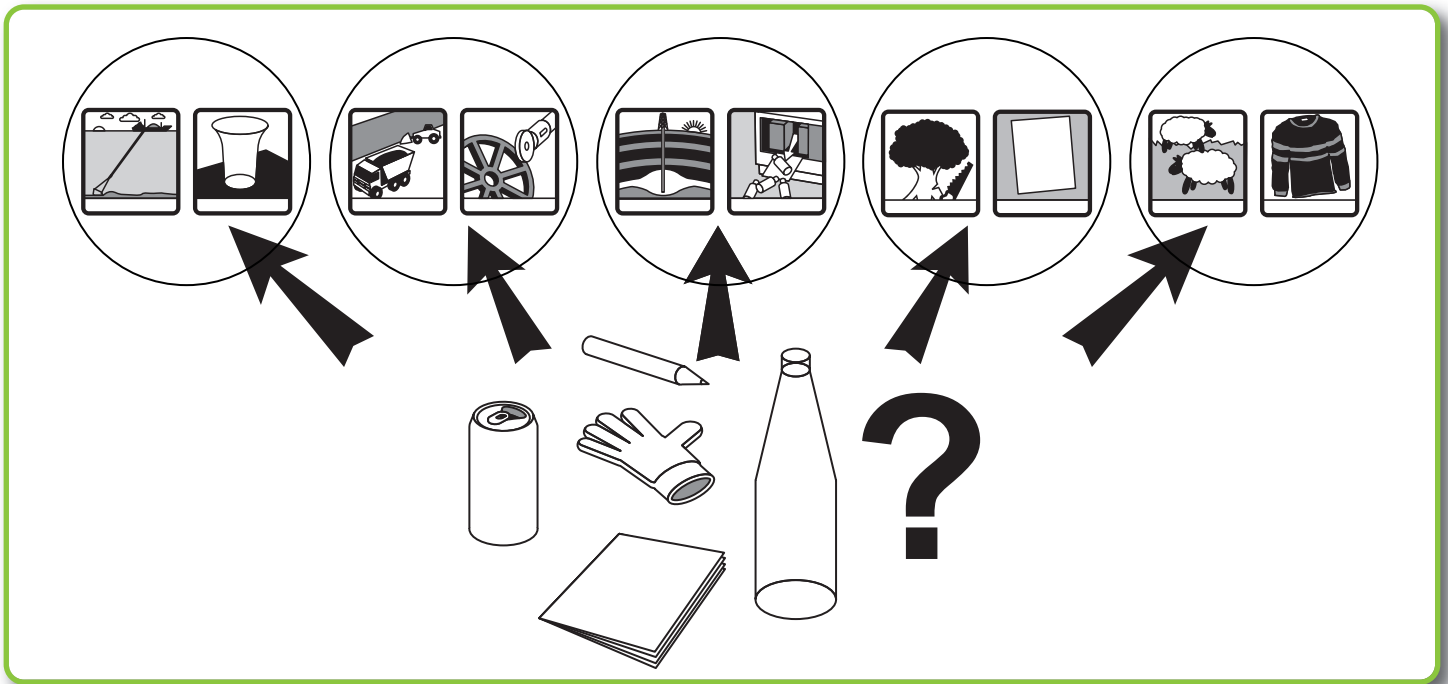
Time needed: 20 - 30 minutes allowing for discussion

Objective: To show the association between the 'new' recycled object and the original Natural Resource.

Place Natural Resource cards with their corresponding Finished Product cards on tables around the room (Glass cards 1 and 10, Metal cards 1 and 7, Plastics cards 1 and 9, Wood cards 1 and 9, and Wool cards 1 and 10).

Split the children into small groups or pairs. Explain that there are several items within the room made from recycled products.

Ask each group / pair to find one recycled item and stand next to the table they believe shows both the Natural Resource and Finished Product.



When each group / pair has found an item and stood next to a corresponding table, ask each group / pair in turn why they believe their product belongs on that table, e.g. a pair that found a paper carrier bag should be next to the table showing trees and paper.

Follow-on activity

Once the recycled items have been put on the correct tables add the remaining **FULL CYCLE CARDS** to the corresponding Natural Resource cards and ask each table if they can arrange the cards into the correct sequence, adding in the recycled items they have found at the correct place.

QUICK EXERCISE 1

Distribute the **FULL CYCLE CARDS** to the children and ask them to arrange themselves in the correct sequence starting with the Natural Resource and finishing with the recycled product.

QUICK EXERCISE 2

If you are working with a larger group of children ask 13 children to stand in a line and each hold up a **FULL CYCLE CARD**. The children left without cards can elect a spokesperson and after discussion direct the children holding cards into the correct sequence.



Extension activities

- Children could make collages of pictures of items under the heading 'I was once a
- Discuss the effects of using Natural Resources?
- Discuss what areas of the world the Natural Resources can be found in.
- Do the children recycle any items at home?
- Why should they recycle?
- Older children could write a short autobiography of a natural resource explaining the changes they went through during their life.



WARNING! NOT SUITABLE FOR CHILDREN UNDER 36 MONTHS BECAUSE SMALL PARTS MAY CAUSE A CHOKING HAZARD. TO BE USED ONLY UNDER ADULT SUPERVISION.

Please retain the information from this product guide for future reference. We reserve the right to alter designs and specifications (including colours and materials) when such changes are unavoidable. This product conforms to the safety requirements of EN71, ASTM, 16 CFR and The Canadian Hazardous Products (Toys) Regulations.



Other products associated with the Full Cycle Cards are listed below. For more information about any of these, click on the relevant link, or see our web site for the full range of Invicta Education products.

BioDegradabilty Kit

Ref No. 117359

BioDegradabilty Kit Refill Pack 1

Ref No. 117459

Renewable Energy Kit

Ref No. 117059

[Invicta Education Web Site](#)

Invicta ensures that all products designed and manufactured conform with our Clients' requirements. We wholeheartedly support both environmental and ethical trading practices.

The polymers we use are all heavy metal free.

We are able to manufacture in recyclable plastics, water soluble bio-polymers (hot and cold), fully biodegradable bio-polymers and degradable polymers with the aim of contributing to a 'sustainable' future for plastics in the developing world.

Many of Invicta Education's products are the subject of worldwide copyrights, patents and trademarks owned by Invicta Plastics Limited.



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