

UNIT 7: PACKAGING

VOCABULARY

Advertising	Biodegradable
Bottles	Boxes
Bulk-buy	Cardboard
Cartons	Consumer
Container	Customer
Disposable	Durable
Foil	Fottle
Manufacturer	Non-renewable
Overpackaging	Packaging
Packets	Paper
PET	Plastic
Recycling	Refillable
Reusing	Shopping bag
Supermarket	Waste stream
Household waste	



BACKGROUND

Packaging is part of our modern lifestyle. It makes up about 40% of the household waste we throw away. We rely on packaging to preserve, protect, identify, store, move and sell goods. Apart from the consumer demand and convenience issue, packaging has meant an increase in production efficiency. Packaging has many benefits including preserving food, efficient transportation of goods, providing instructions and information about contents and their uses, increasing food shelf life, and reducing shop theft.

But packaging also creates a waste problem. Modern society relies heavily on packaging, especially plastic, for our convenience-oriented lifestyle. In our grandparents' days, packaging served only to protect or temporarily preserve a product so only minimal packaging was used. Today's problems with packaging have arisen because single-use and throwaway packaging has often replaced reusable, refillable containers.

Overpackaging wastes resources. A product is overpackaged when it is small in comparison to the packaging; packages contain unused space or thick walls to overstate the size or amount of contents; or the package costs more than the contents. An example of an overpackaged product is perfume that is contained in a glass bottle then wrapped in tissue paper and put in a paper box which is then wrapped in plastic. Only the glass bottle is necessary to contain and protect the perfume. All the other packaging is used for decoration, appearance and to sell the product. Companies use package as an advertising medium to help sell the product.

PACKAGING

Materials students may bring from home


sticks from trees (one per student or group)
pieces of clean sacking or scrap material from home
brown paper and string
ruler
pencil cartridge
paints
stencils
glue or staples
newspaper
wallpaper paste (for papier mache)
strip of cartridge paper, coloured a flax colour or traditional ecru colour or black
curled paper (to simulate feathers)
modelling clay
tapa cloth baskets and wrapping
brown paper
brown crayon
staples and glue
varnish
old magazines
samples of disposable products
posterboard
glue
5 examples of packaging from each of the following area
 natural (peanut shells, egg shells, orange peels)
 synthetic (plastic, styrofoam , aluminium)
2 cardboard boxes – one marked 'natural'
 one marked 'synthetic'
variety of cereal boxes
2 apples
ribbon
generic cereal box
variety of plastic bags
large needle
several metres of medium weight fishing line or tough th
cardboard box



PACKAGING THROUGH THE AGES

An introduction to packaging


KEY CONCEPT



Many cultures throughout the ages have used packaging to protect, preserve and carry items.

Packages can be made from natural or synthetic materials.

LEARNING OBJECTIVES



Students can learn about the history and uses of packaging and will understand its advantages and disadvantages.


MATERIALS



Students will create packages using one or more of the following items:

- Sticks from trees (one per student or group)
- Pieces of clean sacking or material from home
- Brown paper and string
- Ruler
- Pencil cartridge
- Paints
- Paper colouring equipment
- Stencils for lettering
- Glue or staples
- Newspaper
- Wallpaper paste (for papier mache)
- Indothane (optional for papier mache)
- Strips of cartridge paper, coloured a flax colour or the traditional ecru colour and black
- Curled paper (to simulate feathers)
- Modelling clay
- Tapa cloth baskets and wrapping
- Brown paper
- Brown crayon
- Staples and glue
- Varnish
- Worksheet 18 "Types of Packaging 1"
- Worksheet 19 "Types of Packaging 2"

BACKGROUND INFORMATION



Packaging has been used for centuries as a means of storing and transporting goods. In modern society, we also use packaging as a means of marketing or selling products.

Humans have always invented ways of wrapping or packaging precious commodities. This packaging was developed according to resources available, cultural traditions, wealth of the culture or individual, and intended use.

Early Man followed the seasonal migration of the herds that provided their food, clothing and summer shelter. They used animal skins tied with sinews to wrap food and possessions.

As time progressed, humans became more settled and developed an agrarian civilisation. Stone containers were used for grinding grains and stone jars were developed for storage.

Clay containers were later developed but were not durable. They were usually discarded after a short time as they broke easily. With the development of ceramics and firing techniques, came decoration for beauty and glazing which sealed the container and rendered it suitable for long term storage, as it was proof from air and moisture.



With the discovery of iron and other metals came the development of new and durable containers such as iron cooking and storage pots and copper and brass containers.

Civilisations in China and Japan developed porcelain, ceramic and some clay containers of great beauty, strength and durability. Silk cloth was also used to wrap precious commodities.

The Greeks and Romans used pottery, ceramics and glass. The Romans were famed for their glass bottles used for perfume.

In Europe in the Middle Ages hardened leather was used to make storage and travel chests and carved boxes were used for storage. Sacking bundles tied with twine and fixed to a stick was a common form of packaging for foot travellers.

The Egyptians used the sarcophagus for storage of their mummies.

Packaging is no longer used only for storage and transport. It is used to sell the product. With a wider range of products, competition to sell and a strong profit motive, modern packaging serves as a marketing tool. This modern phenomenon often results in what is called "overpackaging" – packaging that is superfluous, not necessary and wasteful. The majority of this packaging is designed to be used once and then disposed.

LEARNING STEPS

1. Compare two early types of packaging, e.g. glass and stone. How were they made? What purpose did they serve? How are they different and why?
2. Choose one of the civilisations mentioned in the Background section. Study, in more detail, the types of packages they used. Describe preparation for a long journey. What did the people use to wrap up their possessions for safe transporting? How did they make these containers? What raw materials were used?
3. Create a few packages originating from various time periods and cultures. As

the students create the packages, discuss how they were used, what raw materials were used in making them, how they might be used today, etc. Here are a few examples of packages to make:

- A. Sack bundle on a stick (Early Man through modern day), Fig. 1:
Use a stick from a tree and a piece of clean sacking or scrap material from home. Stuff the sack with "belongings". Make "skin" package from brown paper and pretend sinews from brown string.
- B. Papier mache "feather" box/Waka Huia (Maori), Fig. 2:
Use newspaper torn into strips and wallpaper paste to make papier mache boxes. Use paints to colour and decorate the finished box. Clear Indothane can be used to seal the box.
- C. Clay pots (China, Japan, Greece and Rome):
Use modelling clay, clay boards or newspaper to work on, find some tools to make a design with. Glaze to finish.
- D. Flax kits or kete (Maori), Fig. 3:
Used for carrying food or belongings. These were either bag shaped or basket shaped.

Ask one of the Auckland Museum Education Staff on (09) 309 0443 or a local knowledgeable person to come and show the students how to make a flax kit. Or, make your own using the attached diagram.

Use either strips of cartridge paper coloured a flax colour or the traditional ecru colour and black, which can be woven or alternatively the students can prepare their own flax (see Fig. 4). Some kits had feathers woven into them, use curled paper for this. Insert curled paper into woven mat and glue into place.

- E. Tapa cloth basket or Wrapping (Polynesia), Fig. 5:
Brown paper is best for this but white cartridge will do. First, crumple the paper up, then spread it out flat. Lay



a brown crayon on its side and colour in the whole sheet lightly to give the effect of cloth. Copy or make up your own tapa cloth design. Traditional colours used were black and brown, on a pale terracotta background.

For older students, crayon and dye techniques can be used to create a tapa cloth pattern. Once the "cloth" is made, the basket can be made. Use staples and glue to join the edges and varnish the finished article, inside and out, for added strength.

EXTRA ACTIVITIES

1. More Maori Packaging

Discuss various Maori packages:
Woven mats – used for wrapping food in before placing in the hangi. Food was cooked and served on flax mats. (see Fig. 6)

Kumete – large wooden bowls used only for mixing the dye for colouring the flax used in weaving. Try making one with papier mache.

Stone jars – used for storing birds, these often sat inside a decorative plaited or woven netting, with carved bone or greenstone decorations.

Waka Huia – the carved wooden boxes used to store Huia feathers in. The feathers were used as head ornaments by chieftains and were considered sacred.

Making a Waka Huia: You will need supplies for making papier mache boxes with a lid (see Fig. 2). "Carvings" can be moulded into the lid on the wet papier mache. Use paints for colouring. Buttons, beads or shells can be set in for eyes or other decoration.

2. Make a gourd

Gourds were used for storing and preserving birds. (Fig. 7, Note: Drawings taken from NZ Maori Arts and Crafts, Gren Powell, Seven Seas Publishing Pty. Ltd., Wellington). The gourd was sealed with the fat the bird was cooked in. Seed for the gourds were brought with the Maori and are available on order from

seed merchants.

A. Papier mache or clay gourd

Create a gourd from papier mache or clay (see attached diagram of a gourd). A traditional design can be drawn onto the surface of the gourd with crayon in red and black, brown and whit, etc.

B. A real gourd

This is a long term project, which must be planned in advance to allow time to grow the gourds in the school gardens.

- a. Grow fruit to maximum size, lying on a bed of straw.
- b. The well ripened fruit is sun dried away from rain until the shell rings when tapped by a knuckle.
- c. Using a crayon, apply the design to the not quite fully dried gourd.
- d. Sharp tools are needed to cut the top of the gourd.
- e. Staining: Spirit based leather dyes are good, but try the dyes used in the classroom or printing inks. Rub in carefully to the pattern only, taking care that the remaining surface of the gourd is not touched.
- f. Varnish the outside of the gourd to increase the keeping properties.

3. Design a box

A square or pyramid shape is best for primary school age; Std 4 and up could manage a hexagon or pentagon.

You will need: ruler and sharp pencil, rough paper for the draft and good cartridge paper for the finished article, felt pens or other medium, and spray varnish.

Using Fig. 8 diagram as a guideline, draw the box shape complete with flaps. Unless the measuring is very accurate the finished box will not join up successfully. Compare and contrast the finished products with modern commercially manufactured containers and historical/ethnic packaging. Display the boxes in the library or school foyer with written and diagrammatic explanation of how the boxes were made.



WORKSHEET 18



Fig. 1 Bundle on a Stick



Fig. 2 Waka Huia (Feather Box)



Fig. 3 Flax Kit or Kete



Fig. 4 Woven and Feather Kete

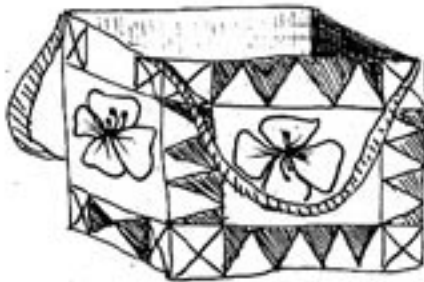
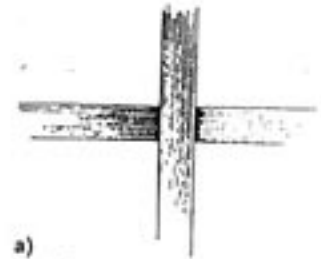
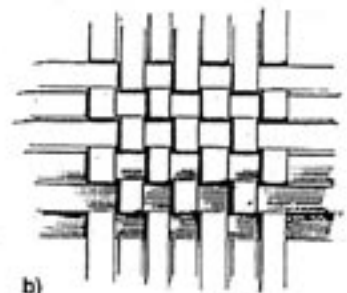


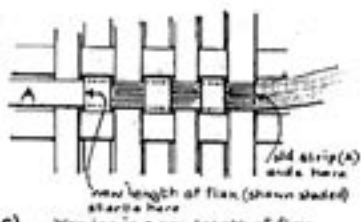
Fig. 5 Tapa Cloth Basket



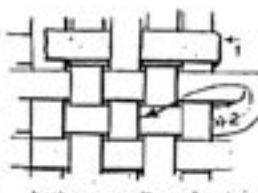
a)



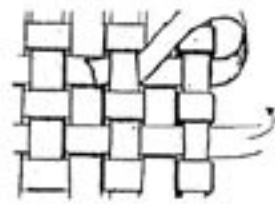
b)



c) Weaving in a new length of flax



d) back-weave alternate stripe



e) turn over & back-weave over stripe

WORKSHEET 19



Fig. 7 Make a Gourd or Hue

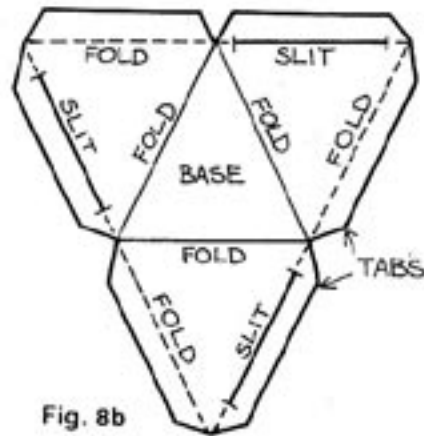


Fig. 8b

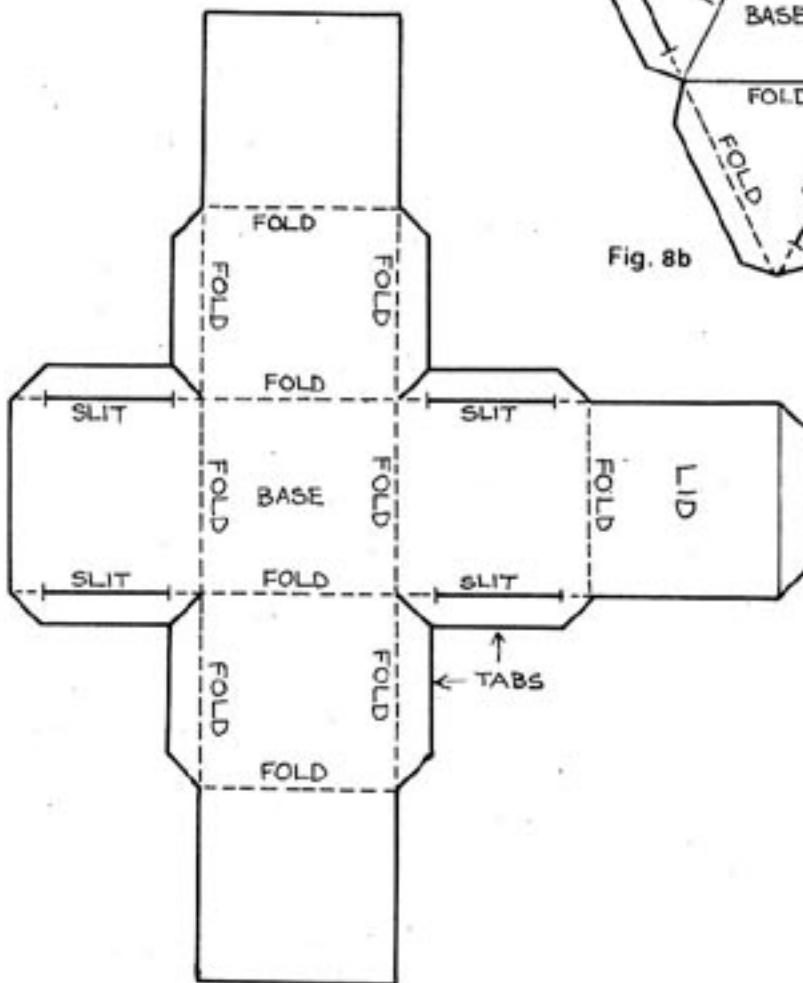
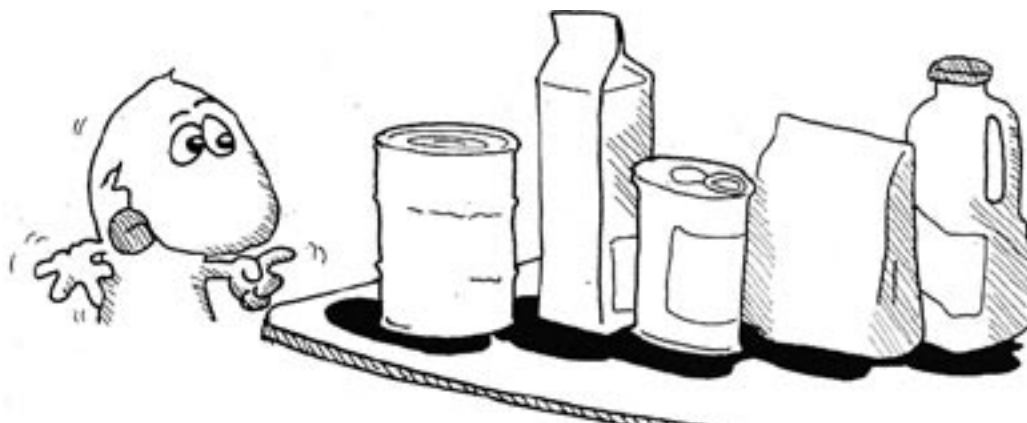


Fig. 8a Design a Box

CONTAINERS ... ONE TOO MANY?

A Survey of Home and Classroom



KEY CONCEPT

A significant portion of waste is packaging.

bathrooms, or bedrooms are filled with containers often discarded. It provides an opportunity to survey their home and graph the containers available.

LEARNING OBJECTIVES

After discussing the use of containers and making their own container, (Packaging Through The Ages Lesson,) each student will survey his or her home kitchen, using a provided survey sheet. Students will gain awareness of which items in their home are reused and which are discarded.

LEARNING STEPS

1. Students list the types of containers they use at home, such as glass bottles and jars, steel/aluminium cans, plastic containers, cardboard boxes and aerosol cans. What are they used for?
2. Distribute Worksheet 20. Students to complete the worksheet at home, using containers throughout the kitchen, lounge, bathroom, bedrooms and garage. Have students return the surveys to class for discussion.
 - 2a. Returned surveys are graphed on large kraft paper. Amounts may need to be in 5's or 10's, depending on the number of surveys returned.
 - 2b. Graph reusable versus throwaway container counts. Compare numbers of containers reused with number that are thrown away in the rubbish.
 - 2c. Discuss with students that reusing containers can reduce waste in their homes. Discuss the concept that if we reuse more of the containers (packaging) we throw away, we would use less resources for production of replacement products.

MATERIALS

- Worksheet 20 "Survey of Containers"

BACKGROUND INFORMATION

We use an abundance of containers. We thoughtlessly throw containers away after using them only once or after we get the product inside. We often choose a less expensive disposable product. We are given new paper and plastic bags with each trip to the supermarket. We give very little thought today to packaging and recycling of products. This lesson helps establish an awareness in children that their kitchens,

EXTRA ACTIVITIES



1. Favourite Container

Ask students to count the containers in their bedroom and classroom and draw a picture of their favourite container.

2. Packets of mathematics

What is the volume of a container – a packet, carton, bottle, can, etc.? What is the volume or mass of the contents compared to the volume of the package? Deceptive packaging perhaps? Or waste of materials? Measuring, estimating, calculating. There is plenty of scope in the mathematics of packaging

WORKSHEET 20

SURVEY OF CONTAINERS

How many containers do you have in your home?

Juice boxes	
Milk jugs	
Glass bottles and jars	
Aluminium cans	
Cardboard boxes	
Soft drink bottles	
Icecream containers	
Aerosol cans	
Steel cans	
Plastic bread bags	
Aluminium foil	
Plastic margarine/butter tubs	
Other?	

WHAT IS IT MADE OF?

Packaging - Natural and Synthetic



KEY CONCEPT

There are natural and synthetic types of packages. Many products are overpackaged.

LEARNING OBJECTIVES

Students will learn to distinguish between synthetic packaging and natural packaging. Students will learn about the use of, origins of and demise of various packaging

MATERIALS

- Posterboard
- Glue
- 5 examples of packaging from each of the following areas:
 - Natural (peanut shells, egg shells, orange peels, etc.)
 - Synthetic (plastic, styrofoam, tin, foil, etc.)
- Parent letter
- Two show boxes, one marked "natural" and one marked "synthetic".
- Worksheet 21, "Natural vs. Man-made", folded in half

BACKGROUND INFORMATION

Be sure to send parent letter home allowing enough time to collect rubbish items.

LEARNING STEPS

1. Class discusses synthetic packaging and natural packaging. Show comparisons on the worksheet.
2. Discuss the purpose of packaging, including the relationship between the product and package.

Why do we have packaging?

How is packaging different now from our grandparent's days?

Which packages create less waste?

What are possible ways to reuse or recycle each of the packages discussed?

Are there any that can't be reused or recycled? Why?

What makes natural packaging better than the synthetic packaging?

What are the functions of today's packages? Show instances where goods have been double packaged.

3. Students break up into groups and discuss the items they bring as either natural or synthetic, and try to think about which items would eventually decompose and which would remain rubbish.
4. Class place packages and wrappings (packaging) in a rubbish sack as it is passed around the room. Ask for helpers to sort the wrappings and place the wrappings in the appropriate box marked natural or synthetic. The food that was inside the wrapper can be cut into small pieces, shared and enjoyed. Students will observe the items in the boxes for several days. What changes occur? Wait and see!

EXTRA ACTIVITIES

1. Before Plastic Packaging

Ask the oldest person you know what it was like to go shopping when he or she was a child. Were their supermarket trolleys? How many kinds of breakfast cereal were available? What came in cans? How were groceries brought home from the shop? Was any packaging material saved and reused? What happened to food scraps?

How was life different without the convenience foods we have today?

2. Canned history

Invite some senior citizens along to the school – and especially anyone involved in the supermarket or dairy businesses. What did they use to package food before cans? What used to be sold in cans or tins (e.g. cocoa, biscuits, baking powder) which is now packaged in cartons, plastic, foil? What was a supermarket like fifty years ago? Why has packaging changed since then?

3. Design a package

Design your own product in a package that is completely recyclable or in a container that could be reused for another purpose or refilled to save packaging. Discuss ideas, plan and drawings, and complete a PMI chart for these ideas, (i.e. Plus/Minus/Interesting) and then encourage production of prototype packaging. Could we have edible food wrappers?

4. Materials study

Glass, plastic, PET, HDPE, aluminium, paperboard, foil, cardboard...Gather samples of as many packaging materials as you can. Study and experiment with these in terms of strength, weight, cost, resources and energy used in manufacturing, protection from sunlight, breakage, ease of recycling, etc.

5. A study of advertising

Using the packages you have collected, make a study of packaging design. What catches the eye when it is displayed on the shelf? Where is the barcode? Where are such things as the manufacturer's name and address, recipes, puzzles, competitions or special offers? Do all these things influence the size and type of container? Could the package size be reduced?

Dear Parents,

We have been working on an environmental education unit in school. We are learning about recycling, waste reduction, and conservation of natural resources. We will be working on a lesson observing and comparing synthetic versus natural packages.

Could students please bring one item from each list?

List A (Natural packaging)

orange
banana
apple
peanuts in shell

List B (Synthetic packaging)

small box of sultanas
juice in box
wrapped muesli bar

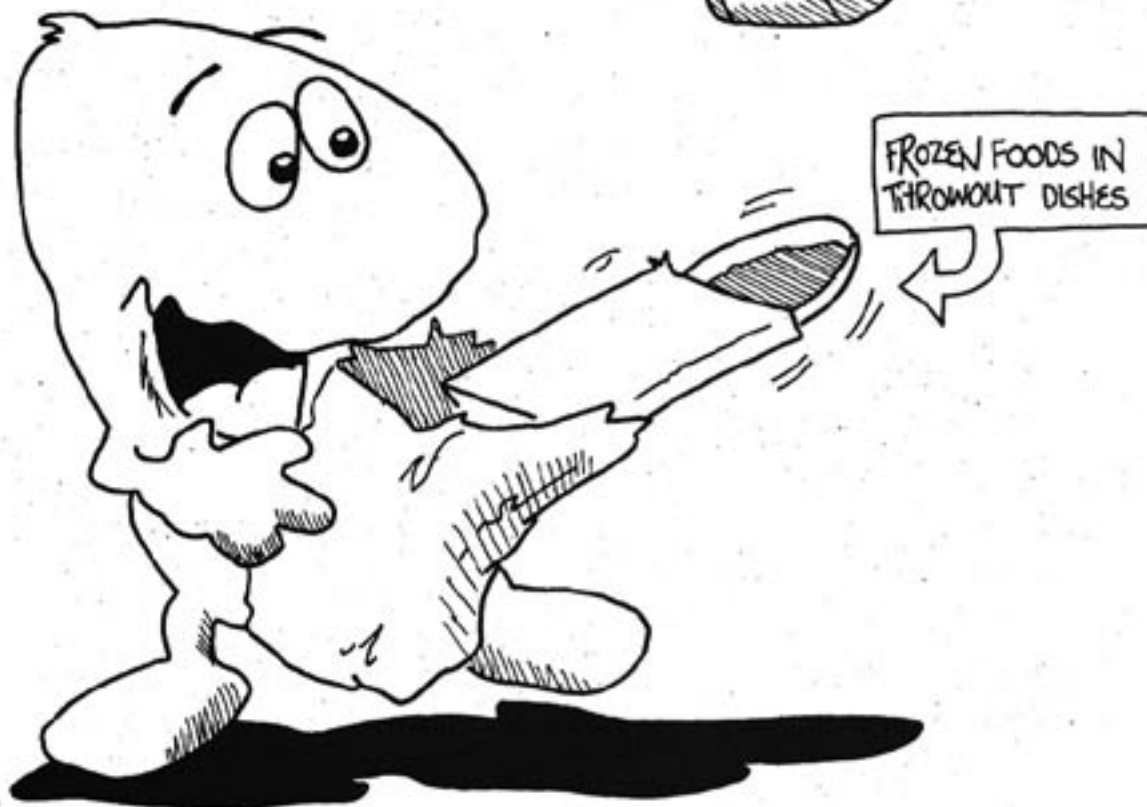
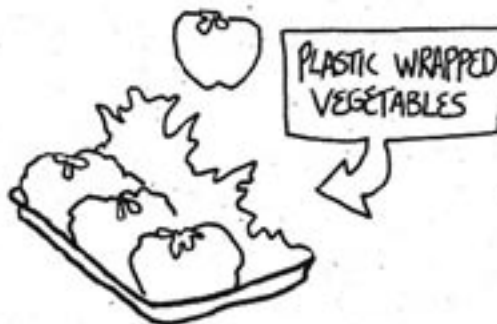
Other small items with natural packages or synthetic packages are welcome. Please send food items before

_____ (date needed)

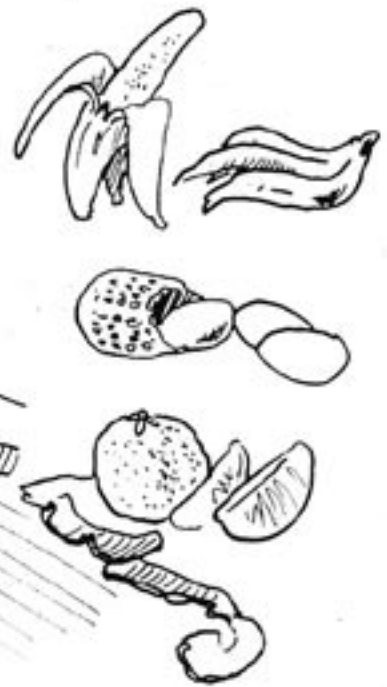
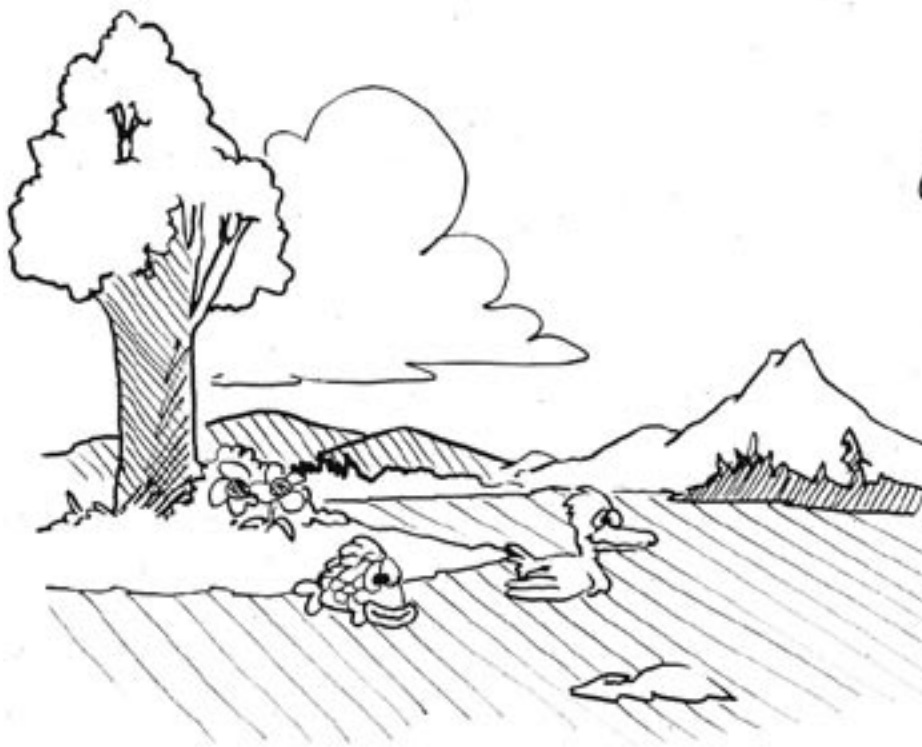
Thank you.

Yours faithfully,

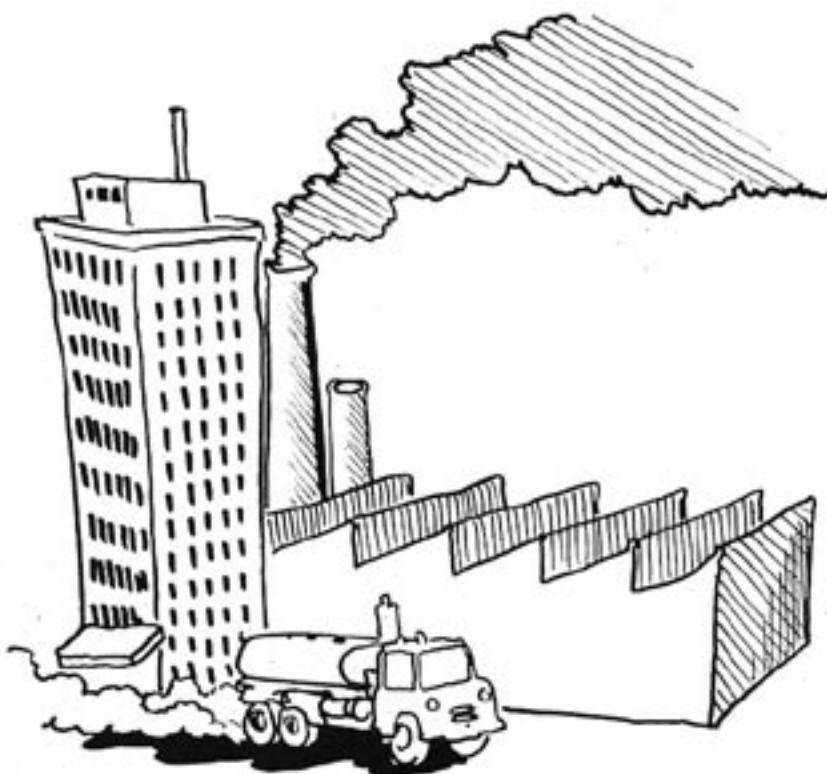
THE FOOD PACKAGING EXPLOSION



WORKSHEET 21



NATURAL



MAN MADE / SYNTHETIC

ALL WRAPPED UP!

Packaging does not make the product



KEY CONCEPT

Packaging helps to sell products. Many products are overpackaged.

LEARNING OBJECTIVES

Students will be able to recognise how they are influenced to buy products based upon packaging.

Students will be able to determine if products are minimally packaged.

MATERIALS

- Variety of cereal boxes
- 2 apples
- Ribbon
- Generic cereal box

BACKGROUND INFORMATION

Packaging provides a number of necessary functions, including product sanitation, protection and preservation. However packaging is more commonly used to capture the buyer's attention. This "overpackaging" has led to a serious waste management problem. Packaging constitutes nearly 40% of New Zealander's household waste.

LEARNING STEPS

1. Bring two apples to class and a fancy bow. Show the apples to the students, placing the bow on one of them. Ask the students which one they would like to buy. Why do you want one apple over another? How do people package

things (products) so that it makes you want to buy them? See how many types can be collected.

2. Have the children bring in an empty cereal box. Supply a "generic" cereal box if one isn't brought in by the students.
3. Display the boxes and take a survey of students' preferences of the available samples.
4. Discuss with the students why they selected a particular sample (drawings, colours on package, contents, taste, etc.)
5. Look at products that are packaged and the same product unpackaged. Is there a price difference? Look for a variety of items. Make up lists. Compare food prices at a bulk food shop versus a supermarket. Is there a difference? Why?
6. Watch television commercials. Ask students how the commercials affected them. Did they notice the packaging? Did they want to buy the product?
7. Take a trip to the supermarket or a toyshop. What are the different types of packages? What packaging is really necessary?

EXTRA ACTIVITIES

1. Household Survey

Among all the waste produced in the course of a week or month concentrate on packaging. How much of the household waste is made up of

discarded packaging? Some claim the figure is about a third of all household waste – what figures for waste packaging volumes does your class have?

2. Design a Package

Design your own product in a package that is completely recyclable or in a container that could be reused for another purpose or refilled to save packaging. Discuss ideas, plan and drawings, and complete a PMI chart for these ideas, (i.e. Plus/Minus/Interesting) and then encourage production of prototype packaging. Could we have edible food wrappers?

3. Packets of Mathematics

What is the volume of a container – a packet, carton, bottle, can, etc.? What is the volume or mass of the contents compared to the volume of the package? Deceptive packaging perhaps? Or waste of materials? Measuring, estimating, calculating. There is plenty of scope in the mathematics of packaging.

4. The Whys and Wherefores

Look at a great variety of packaging your class has collected and the results of your supermarket or shop survey – why do we have packaging? Discuss transport, display, safety, protection, spoilage, information to customers and consumer, identification, preservation, retailing and convenience. Look at the materials used, package design, size, shape, printing, etc. Could we do without packaging in our modern society?

PACKAGING...

Wraps it up

KEY CONCEPT

Packaging has many uses and purposes but does present potential problems.



LEARNING OBJECTIVES

Students will understand what packaging is, what forms it takes, and what role it has in our society.

students to thinking about the reason for packaging, about some of the undesirable aspects of packaging and discriminating between necessary and wasteful packaging.

MATERIALS

- Variety of plastic bags
- Large needle
- Several metres (approx 5 m) medium weight fishing line or very tough thread
- Box to store bags in until ready for use

2. To give students a tangible idea of the volume of packaging they use, have them create a "bag garland" from used lolly, crisp or snack bags picked up from around the classroom and school grounds.

BACKGROUND INFORMATION

Packaging has a significant impact on our environment. It represents nearly 40% of the waste we generate.

Ask students to bring in clean bags over a two week period. You can use any sort of bag.

Tell children to open bags carefully at the top when using. Bring clean, empty bags to class. Flatten bag. Fold each corner to centre so a needle with thread can be pushed through. Each new bag adds a "rosette" to the garland. As the garland gets bigger, hang it in loops.

LEARNING STEPS

1. To increase student awareness of packaging, discuss its uses and abuses, using one or more of the following initiators:
 - a) Various packages to contrast types and uses.
 - b) Packaging which has found its way into the litter stream.
 - c) Photographs of rubbish tips, supermarket shelves, rubbish bins.
 - d) An excessively packaged item, e.g. gum.

Discuss the garland in terms of the following waste topics:

Rubbish: This garland shows how much of one simple type of rubbish we produce over weeks or months.

Litter: Suppose we had thrown all of the bags on the ground. Where does the litter end up?

Re-use: The garland demonstrates the principle of reuse.

This discussion should introduce

EXTRA ACTIVITIES

1. All Sorts of Packages

Discuss the useful aspects of packaging. Write a list on the board of different generic types of packaging. List benefits and problems. Students should collect a variety of packages that fulfil various functions. Sample questions and activities could include:

Is packaging only a modern phenomenon? Explain.

Why do we need packaging? (Protect the product, keep it from spoiling, etc.)

2. A supermarket trip

Ask each student to take a trip with his or her family to the local supermarket. Assign each student a type of product, (e.g. meat, bread, milk, lolly, cheese, bananas, soda pop, etc.) and ask that they notice how it is packaged.

How is it packaged?

Is there a choice of packaging for the product, e.g. fizzy drink in glass bottle, aluminium can or plastic bottle?

What is the packaging used for? (protection, identifying product, etc.)

Can it be recycled? Reused?

Could the product be wrapped with less packaging?

3. Advertising

Create a new product that is recyclable and “environmentally friendly”. Now design a full page newspaper or magazine advertisement to “sell your product” stressing these advantages. Follow this with an advertisement or TV campaign encouraging people to carry out the correct waste procedures.

Investigate the effects of advertising, e.g. are people encouraged to buy environmentally friendly products? Has advertising increased the volume of recycled packaging?

THROWAWAY LIVING IN THE 1990's



WORKSHEET 22



Find the Packaging Words in the "Word Finder"

1. Commercial Pressure
2. Household Waste
3. Overpackaging
4. Incineration
5. Manufacturer
6. Advertising
7. Legislation
8. Supermarket
9. Shopping Bag
10. Wastestream
11. Containers
12. Pet bottles
13. Refillable
14. Labelling
15. Cardboard
16. Plastics
17. Consumer
18. Barcoders
19. Customer
20. Disposal
21. Retailer
22. Cartons
23. Packets
24. Product
25. Fottles
26. Reusing
27. Bulk buy
28. Lining
29. Boxes
30. Aluminium foil
31. Bag

NI URE MOTSUCRSL LXNCSR
 GNI GAKCAPREVOCUTOEEP
 HDWKGKXAIRWRPEIMLRPQ
 QSTEKCAPENEIYDMTURWE
 FANDPITFOTHSMETTSRRK
 OSCOGEICAFHZROCHLAWY
 IWUTILTIUOKCFAMOGALB
 LLEPLTLBPDI DFAAUUVYP
 DXAAEEAPOA OUMRESRVGA
 ORBSRRI RL TNREJ REWIGD
 SLA AONMPEATMPMTHVFNV
 ELYOGPRAMNULDFSOSLIE
 GIIBBESGRSIBEOELSLR
 NDANS DHI NKOC PSTDNALT
 IGKSI GRODXESNGSWOREI
 SSUARNCAEUJTIIAATCBS
 URLOKAGSCUWKJSWSROAI
 ECTELEGISLATIONTADLN
 RCONTAINERSKTRCECEJG
 FLZCKXAQZYUBKLUBUSTK

