UNIT 10
WASTE & RECYCLING

Vocabulary
- **Waste disposal**
- **Recycling and materials recovery**

Grammar and functions
- **Describing processes: Sequencing –** *(used with writing 2)*
- **Revision of grammar structures**

ORAL PRACTICE

Say if the following elements are recyclable (R) or non- recyclable (NR)

glass	plastics	sewage	cloth	iron
oil	gold	newspapers	petrol	water
batteries	tin	appliances	tyres	trees
Al cans	glass bottles	cartons	cardboard	toner
Pottery	Mobiles	Li cells	lubricants	paints
solvents	drugs	wood	light bulbs	bricks

RECYCLABLE

_____
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NON RECYCLABLE

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What can you say about the picture?

Source: ***http://www.egipps.vic.gov.au/Page/Images/bin.jpg***

TRANSLATION: RESOURCE RECOVERY

Numerous thermal processes recover energy **_IN DIFFERENT WAYS FROM SOLID WASTE** (*de diferentes formas a partir de residuos solidos*).
_THESE SYSTEMS ARE DIVIDED INTO TWO GROUPS (E*stos sistemas se dividen en dos grupos*): combustion processes and pyrolysis processes.
A number of companies burn in-plant wastes in conventional incinerators **(IN ORDER/SO AS) TO PRODUCE STEAM/VAPOUR** (*para producir vapor*); **THE WATER CIRCULATING** (*el agua que circula*- SHORT.REL. CLAUSE) through the **tubes/PIPES PERMITS/ALLOWS HEAT TO BE ABSORBED/lets heat be absorbed TO GENERATE STEAM/VAPOUR** (*permite que el calor se absorba para generar vapor*).
Pyrolysis **CONSISTS OF/IN CHEMICALLY DECOMPOSING/BREAKING DOWN SOLID WASTE** (*consiste en descomponer químicamente residuos sólidos*) by heat in an oxygen-reduced atmosphere. **THIS RESULTS IN/GIVES RISE TO/LEADS TO/BRING ABOUT A GAS THAT/WHICH CONTAINS/containing** (E*sto da como resultado un gas que contiene*) various gases, **ACCORDING TO/DEPENDING/ON THE BASIS OF THE ORGANIC FEATURES/CHARACTERISTICS OF THE PYROLISED MATERIAL** (*según las características orgánicas del material pirolizado*).
IF USERS/CONSUMERS SEPARATED/SELECTED WASTE, A LARGER AMOUNT OF WASTE COULD BE RECYCLED (S*i los usuarios separaran la basura, se podría*

reciclar una mayor cantidad de residuos) and that would improve life in our planet since **THE GREATER THE RECYCLING VOLUME, THE LONGER NATURAL RESOURCES WILL LAST/the more durable the natural resources** (*cuanto mayor sea el volumen de reciclaje, más durarán los recursos naturales*).

LISTENING1: WASTE DISPOSAL

1- Which are the four main sources of waste and how much each of them accounts for?
WASTE FROM MINES, 39% // WASTE FROM AGRICULTURE, 53% //-DOMESTIC WASTE, 6% //INDUSTRIAL WASTE, 2%

2- Where does it go? -OPEN DUMPS, 55%
-NOT COLLECTED, 23%
-BURIED IN THE GROUND BY THE LANDFILL METHOD, 12%
-BURNT, 9%
-DUMPED AT THE SEA, 1%

3- From now on let´s just consider domestic waste and let's discuss in more detail what happens to it and how we are improving our methods of dealing with it. Domestic rubbish is usually disposed of in one of 3 ways, all of which have their pros and cons.

- Open dumps have the advantages of : BEING EASY TO OPERATE and of BEING THE CHEAPEST OF THE THREE METHODS

- However, their disadvantages are that they are unsightly, THEY CAUSE AIR POLLUTION WHEN RUBBISH IS BURNT, THEY SMELL, MATERIALS ARE WASTED AND SO IS LAND and they can contaminate ground water and nearby streams.

- Land fill (putting domestic refuse in holes, compacting it and covering it with earth) has the following advantages: IT IS CHEAP, there are no (objectionable) SMELLS OR PESTS and when the landfill is completed, THE SITE CAN OFTEN BE MORE USEFUL THAN IT WAS BEFORE

- The disadvantages of landfill: IT WASTES MATERIALS and IT USES A LARGE AREA OF LAND which may not be available near urban centres.

- Incineration is BURNING. Advantages: can handle about 80% OF DOMESTIC RUBBISH and CAN REDUCE ITS VOLUME BY ABOUT 90%; it requires VERY LITTLE LAND and it produces INCOME FROM THE RECOVERY OF WASTE METAL AND GLASS

- Disadvantages: IT IS EXPENSIVE TO BUILD AN INCINERATION PLANT and IT CAUSES AIR POLLUTION unless sophisticated pollution controls are installed

READING: WASTE DISPOSAL

The disposal of normally solid or semisolid materials, *resulting*(1) ***which result*** from human and animal activities that are *useless*(2), ***inútil – it has no use/not useful*** unwanted, or *hazardous*(3) ***dangerous*** is known as solid waste disposal. Solid wastes typically may be classified into a variety of groups, *including both decomposable and non-decomposable wastes*(4), ***incluyendo/que incluyen tanto residuos orgánicos como inorgánicos*** either combustible or non-combustible, from organic or industrial origin.

1. *resulting* – turn into a complete relative clause
2. *useless* – translate and give the word formation
3. *hazardous* – give a synonym
4. *including both decomposable and non-decomposable wastes* – translate

The most commonly used method for solid waste disposal is called 'on land', followed by incineration, *whereas* (5) ***contrast =while mientras que*** composting of solid wastes accounts for only an insignificant amount. *Selecting a disposal method depends almost=nearly entirely=completely,wholly on costs*(6), ***seleccionar un método de eliminación (de residuos) depende casi por completo del coste*** which in turn=*a su vez* are likely to reflect local circumstances.

Landfill is the cheapest satisfactory means=*way*,*method* of disposal, but only if suitable land is *within economic range of the source of the wastes*(7) ***dentro del rango económico de la fuente de residuos*** *as*(8) ***puesto que, ya que/since, because*** collection and transportation account for 75 percent of the total cost of solid waste *management*(9) ***gestión – to manage+ment=noun*** In a modern landfill, refuse is spread in thin *layers(*10), ***coats - films*** each of which is compacted by a bulldozer before the next is spread. When the layers of refuse are about 3 m(10 ft) thick, a thin layer of clean earth is added, and then compacted, too. Landfills need to be properly vented and safe from groundwater flooding.

5. *whereas* – is used to express…

   Selecting… costs – translate into Spanish
6. *within economic range of the source of the wastes* – translate into Spanish
7. *as* - translate and give a synonym ***puesto que, ya que – since, because***
8. *management* – translate and give word formation ***noun***
9. *layers* – give a synonym ***coats, films***

In incinerators of conventional design, refuse is burned on moving grates in refractory chambers; *combustible gases and the solids they carry are burned in secondary chambers*(11). ***los gases combustibles y los (materiales) sólidos que arrastran/llevan/contienen se incineran/queman en cámaras secundarias*** *In addition to*(12) heat, the products of *incineration*(13) include *those*(14) ***the products*** of combustion—carbon dioxide and water—*as well as*(15) oxides of sulfur and nitrogen and other gaseous pollutants; nongaseous products are fly ash and unburned solid residue.

11. *combustible gases and… secondary chamber* – translate

Composting operations of solid wastes include preparing refuse and degrading organic matter by aerobic microorganisms. Refuse is preselected, *to remove*(16) ***eliminate*** materials that might have salvage value or cannot be composted, and is ground up *to improve the efficiency of the decomposition process*(17) ***para mejorar la eficacia del proceso de descomposición***

The refuse is placed in long piles on the ground or deposited in mechanical systems, where it is degraded biologically to a humus with a total nitrogen, phosphorous, and potassium content of 1 to 3 percent, *depending on the material (being) treated*(18) ***dependiendo de/según el material tratado***.

QUESTIONS

12. *In addition to* – give a synonym – ***besides/as well as***
13. *incineration* – explain in English - ***burning***
14. *those* – give the reference in the text – ***the products***
15. *as well as* – translate ***además de***
16. *to remove* - translate ***eliminate***
17. *to improve the efficiency of the decomposition process* – translate into Spanish ***para mejorar la eficacia del proceso de descomposición***
18. *depending on the material being treated* – translate into Spanish ***dependiendo de/según el material tratado***

DESCRIBING PROCESSES: SEQUENCING

In technical language it is vital to give accurate descriptions of processes. A process is a sequence of actions with related causes and effects. Here are some SEQUENCE CONNECTORS and EXPRESSIONS:

First / Firstly / First of all	.... begins /commences with / starts with	Finally / Eventually
In the first step / stage To begin with	The first step / stage is	At the end of the process In the last stage
Secondly, Later, / Afterwards Then, / Next, Subsequently	After this, The next step is ... In the next stage, In the following / next stage	... finishes / concludes with The last step / stage is ....
So far, Up to now		
Beforehand Previously, Earlier,	Before this Prior to this In the preceding / previous / former stage	
At the same time, Simultaneously, Meantime / Meanwhile In the meantime	During .... While ... As ... When ...	

Other useful expressions are:

- To take place
- To carry out
- To occur / happen
- To ALLOW /CAUSE
- One method for /way of ... (+ verb in –ING) .... is to ....
- In order to /so as to
- by means of ...
- (by) using ...
- With the help of ...

VIDEO: THE STORY OF ALUMINIUM RECYCLING

1- Which are the properties of Al? _____ &_____ **LIGHT & DURABLE**

2- What kind of metal s it? _____ **A NON-FERROUS METAL**

3- It is common use? _____ **DRINK CANS**

4- How much was recycled in Devon last year? _____**660 tonnes of Al cans**

5- Which other material is also collected? _____ **STEEL**

6- How is it disposed of? On kerbside **BINS, BOXES, BAGS, RECYCLING BANKS**

PROCESS: Reorder these sentences as you watch the video

a) A magnet is used to separate the steel cans from aluminum
b) A magnetic drum is used to remove any rests of steel
c) After this the aluminium is sent to a reprocessing company
d) And these aluminium sheets are used to manufacture new products
e) Here the aluminum is cut down into very small pieces
f) Next aluminium is crushed and baled
g) Once the cans have been decoated, they are taken to a furnace
h) Subsequently, the liquid aluminum is poured into casts
i) The cans are collected and taken to a recycling depot
j) The square ingots are then rolled into sheets
k) The varnish coat that protected the can is removed before melting the cans
l) This is done by blowing hot air

1 Aluminum cans are gathered from recycling centers
6 They are sent to a scrap processing company where they are collected into large bales.
3 The bales are then sent to an aluminum company where the cans are shredded, crushed, stripped and burned
7 They are then sent into a furnace where they are melted with new, untouched aluminum and the two are melted together.
5 The new aluminum is then poured out into sheets, and cut down into sheets 1/100th of an inch thick.
2 The aluminum then cools, and is coiled up into large rolls and sent to can makers.

4 The can makers then mold the aluminum into can shapes, and send them off to soda makers to bottle their beverage.

Source: ***http://www.youtube.com/watch?v=Plp7HYXCpZA***

VOCABULARY EXERCISE (NOT IN THE BOOK)

- **H_____S/ H_____L MATERIALS** (dangerous, e.g. solvents, asbestos)

HAZARDOUS/ HARMFUL MATERIALS

- **WASTE D _____** (or management)

WASTE DISPOSAL

- **To DISPOSE _____** (preposition)

To DISPOSE OF

- **UNTREATED S _____** (waste water)

UNTREATED SEWAGE

- **REFUSE = G _____, T _____, R _____ & L _____** (4 synonyms)

REFUSE = GARBAGE, TRASH, RUBBISH & LITTER

- **OIL S _____** (accidental release of oil in the sea)

OIL SPILL

- **DEMAND _____ OIL** (preposition)

DEMAND FOR OIL

- **POLAR ICE C _____**
  POLAR ICE CAPS
- **OPEN D _____** (site to dispose of urban waste)
  OPEN DUMP
- **To BE AWARE _____** (preposition)
  To BE AWARE OF
- **TH _____** = menace, peril & Vb = to endanger)

THREAT **(VB = THREATEN)**

- **TO RUN** _____ (to end)
  TO RUN OUT
- **D** _____ **& D** _____ (past & PP of vb DRIVE)
  DROVE **& D**RIVEN
- **To RE** _____ **(**to set free or give off)
  To RELEASE
- **A**_____ **R** _____ (making people conscious)
  AWARENESS **R**AISING
- **E** _____ (finally, last step in a process)
  EVENTUALLY
- **E** _____ **FUMES** (gases from cars)
  EXHAUST **FUMES**
- **ENV** _____ **F** _____ **PRODUCTS** (green)
  ENVIRONMENTALLY **F**RIENDLY **PRODUCTS**
- **L** _____ **METHOD** (burying waste)
  L ANDFILL **METHOD**
- **CONSIST** _____ and **BASED** _____ (prepositions)
  CONSIST OF and **BASED** ON
- **NATURAL R** _____ **(**natural materials**)**
  NATURAL RESOURCES
- **R** _____ **MATERIALS (**untreated materials**)**
  RAW **MATERIALS**
- **ENERGY C**_____ (= use)
  ENERGY CONSUMPTION
- **D** _____ **OF THE OZONE L** _____ (reduction)
  DEPLETION **OF THE OZONE L**AYER
- **TO BE C**_____ _____ (to care about)
  TO BE CONCERNED ABOUT
- **To M** _____ **ENERGY DEMAND** (= To cover)
  To MEET **ENERGY DEMAND**
- **To S** _____ (to provide)
  TO SUPPLY
- **UN** _____ **HY** _____ (hidrocarburos sin quemar)
  UNBURNT HYDROCARBONS