SUPPLEMENTARY MATERIAL

Unit 2: Environmental Challenges

M. Àngels Llavina

Aberdeen University - December 2010

7. ✔ The following website contains a teacher's guide to calculate your carbon footprint.

http://www.meetthegreens.org/features/carbon-calculator.html

Teacher's Guide
Youth Calculator – An Introduction

The first step is for your students to register at the Calculator site: *www.zerofootprint.net/kids* by clicking on the arrow pointing right.

Students are first asked to create a username/password and then to identify their gender, age and school name. Students start by typing in their school name. When their school appears, with the correct city and country, they should select it. Students should keep typing until their school appears or until they are given the option of entering a new school. Students can enter their school name or city.

Next, students are presented with a series of questions and tips, starting with "travel", and then the calculator gives students some "tips" about different options for setting specific goals for themselves (for example, "I will ride a bike instead of travelling in a car"). By setting a goal, they are helping to pledge a reduction of CO2, which will be joined and/or compared with goals set by students of the same age/gender at different schools and in different countries.

The categories are:

Travel
What you eat
Home
What you use
What you throw away

At any time, students can click on the chart/graph/finish button at the bottom right to calculate their carbon footprint. They do not have to

finish all the questions at one time, but can log-off and return whenever they wish to answer any remaining questions.

Calculating one's Carbon Footprint

When a student clicks on the chart/graph button, they are taken to the results page where they can compare their carbon footprints and goals with those of others in the same or different school, country, gender and age group. They can see these comparisons by clicking on the "My School" "Boys/Girls" "Country" or "Age". To compare with a specific school, the student should start typing the school name and keep typing until the desired school's name appears. A comparison with different countries works in the same way.

They can also see how many earths it would take to maintain the level of carbon dioxide that they are producing from their lifestyle if everyone produced the same amount as they do.

In the upper right corner, they can also see the total amount of CO2 that students worldwide have pledged to reduce by changes in their lifestyle. The goal that students are collectively trying to meet this year is to reduce CO2 production by 35,000 tonnes.

Hopefully, these results and the issues raised in the tips/goals can become part of the discussion that students have together in the forum for Our Footprints, Our Future: *www.of2.iearn.org/forum.htm*

ACTIVITY 8 TEXT ABOUT ENVIRONMENTAL PROBLEMS

Text 1

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things that people do, and they are happening fast.

WASTING ENERGY

Our high-tech lifestyles are causing two major problems: fuel stocks are running down, and fuels are damaging the planet as we use them.

The world's energy comes from coal, gas or oil called 'fossil fuels' . Fossil fuels or *non-renewable fuels*, have taken millions of years to form and we are using them up faster than they can be replaced.

Fuels are burned in power stations to generate electricity for lights, cookers, computers and hundreds of appliances. Gas is also burned for heating and cooking. Oil is refined to make petrol and aviation fuel to burn in car and plane engines. All this burning has some dangerous side effects: the harmful gases produced pollute the air and the water and the carbon dioxide (CO_2) is the main cause of one of the planet's biggest problems: CLIMATE CHANGE.

Text 2

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things people do, and they are happening fast.

CLIMATE CHANGE

The planet is gradually getting warmer because of the increasing level of CO2 in the atmosphere from burning fossil fuels. There are other gases that cause global warming too such as methane, which is given off by belching and farting farm animals, growing rice and rotting rubbish. Another is nitrous oxide, released from farm soil as well as burning fossil fuels. These global warming gases are known as greenhouse gases.

Why greenhouse gases?

When the Sun's rays hit the Earth, most of them bounce away. But there is a kind of blanket of greenhouse gases all around the Earth. The blanket works a bit like a glass greenhouse and traps in most of the Sun's heat. This is vital, as without it would freeze to death.

But the problem is that the blanket has now become so thick that it traps in too much heat. This is what is making temperatures rise so dangerously.

As a consequence of warmer temperatures, there are huge sheets of ice at the North and South Poles which are melting. The extra water makes the sea level rise, which means that low-lying islands and places near coasts are at risk of flooding.

Global warming means more heat-waves, droughts and floods, but it also means wilder weather in general, more gales and even hurricanes too. Food crops can be ruined by the wrong kind of

weather, and diseases that thrive in hot conditions such as malaria, may spread.

Text 3

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things people do, and they are happening fast.

AIR POLLUTION

Greenhouse gases aren't the only ones to pollute the Earth's atmosphere. Other gases cause problems too, among them are chlorofluorocarbons - CFCs for short.

What's wrong with CFCs?

The sun puts out harmful ultraviolet (UV) radiation, which is what gives us sunburn. Luckily, we are shielded from some of this by a layer of gas called ozone which lies around the Earth. But, for over 20 years, there has been a worrying hole in the ozone layer.

In the 1980s, scientists discovered the hole was being caused by CFCs. These were used in fridges, air conditioning systems and spray cans. CFCs have now been banned in most countries, but they stay in the atmosphere for up to 100 years. So it could take more than a lifetime for the hole to repair itself.

Acid rain

Air pollution even affects the rain. Some of the gases produced by burning fossil fuels turn the rain acidic. This means it can damage plants and even buildings.

What is smog?

Hundreds of thousands of people in the world die every year from breathing in smog. Smog is caused by a mixture of smoke and waste gases, mostly pumped out from power stations, factories, cars and planes. It's worst on hot, still days, and people with breathing or heart problems are most at risk.

In some countries, their anti-pollution laws aren't enforced.

Text 4

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things people do, and they are happening fast.

A LOAD OF OLD RUBBISH

The mountains of rubbish we create are a big problem for the planet. At last, governments are working out ways to cut down on waste, and individuals are taking action too.

What's wrong with burning it?

Most household waste is taken to landfill sites, where it gets buried underground. This hides it away from view, but it leaves behind lots of problems.

One of the biggest worries is that some rubbish like batteries, hairspray and plastics, releases toxic, or poisonous substances. This can escape into the air or leak into the soil and pollute water that runs underground. Some of this groundwater flows into rivers, harming wildlife. And human drinking water can be polluted too.

Rubbish is very bulky, and more is being added requiring new landfill sites and it won't rot away quickly, so it will be there for centuries.

And food and garden waste in landfill produce methane, which contributes to global warming. The rubbish is taken to the landfill by road, so the journey causes yet more pollution. Last but not least, landfill sites smell.

Why not burn it?

Rubbish burned in incinerators pump fumes into the air that are harmful to the environment and to people, and they produce toxic ash which has to end up in landfill.

Always bin your litter. It can attract flies, mice and rats, and spread disease. And it can harm animals. Glass is dangerous as it can start fires if it is left in the hot sun.

Text 5

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things people do, and they are happening fast.

WATER POLLUTION AND WATER SHORTAGE

Like all living things, we can't survive without water. Our drinking water needs to be clean to prevent us getting ill, but water can become polluted in lots of different ways.

What causes it?

Water gets polluted by chemical waste from factories, farms or landfill sites; by oil spills from ships, and even by litter.

In developing countries, the main cause of water pollution is human sewage (poo) and animal droppings.

Millions of children's lives could be saved every year if they had safe drinking water and toilets, and if sewage drains didn't overflow during floods.

Dead zones

People used to think the sea was so vast that it could absorb any waste dumped in it. But there are now about 150 'dead zones' in the world´s seas, where hardly anything can live.

The main cause is chemicals, they start off a process which leaves the sea and its creatures starved of oxygen, so they die. But it isn't too late. If pollution is reduced now, sea life may return.

Water shortage

A third of the world's people don't have enough water. Many use

less in a day for drinking, cooking and washing than people in developed countries do for a single loo flush.

Not enough rain

Global warming is making water shortage worse. In many places, including the traditionally rainy countries of northern Europe, it now rains less than it used to. By 2025, two thirds of the world's people will probably live in countries that are short of water.

Text 6

Some changes are taking place in the planet and they aren't happening naturally and slowly as they did in the past. Most of them are caused by people and the things people do, and they are happening fast.

CHEMICAL OVERLOAD

Although most of the world's pollution comes from big industries, businesses and transport, there are some pollutants that are much closer to home.

In the home

There are tens of thousands of artificial chemicals in daily use – many, many more than when your grandparents were young. These chemicals are used in plastics, packaging, furniture, paint, cleaning products, toiletries and cosmetics.

They are tested for safety, but no one can be sure how they will affect the environment, or people, over a long time.

In the human body

Household chemicals can be absorbed by the human body. You either breathe them in, or they get in through your skin. Some of these chemicals are called POCs (persistent organic compounds). This is because they never disappear but just continue to build up during your lifetime.

Food

Monoculture, where one crop is grown over a large area, can produce a huge amount of food efficiently and cheaply. But it has its problems. This kind of farming uses a lot of harmful

artificial chemicals.

Artificial pesticides are sprayed on crops to kill insects that damage them, herbicides are used to kill weeds, and fertilisers are used to help crops to grow. But these can all damage wildlife and pollute groundwater. In addition, the traces that remain on food may not be good for people either. No one can tell what the long-term effects will be.

Organic farming uses methods that are as natural and non-polluting as possible. But organic farming needs more land to produce the same amount of food as non-organic.

Genetically modified food comes from plants that have been changed –or modified- to grow in a different way. But some people fear that genes from GM plants may spread to other plants and cause environmental damage.

Food miles are also important. If you buy locally produced food, it avoids the pollution caused when food is transported long distances, sometimes by plane. It also means you get a chance to eat food that's in season where you live. It may be fresher and taste better too.

ACTIVITY 8 EXAMPLE : **Let's have a party at home!**

Let's have a party at home!
Children's birthday parties, fairs, Christmas...

Look after the environment
Avoid generating disposable waste by buying drinks in returnable glass containers or in bulk.

· Prepare punchbowls with bulk-purchased drinks that guests can serve themselves in re-usable cups or glasses using a ladle.

· Encourage the use of traditional shared containers, such as wineskins and pitchers.

· If you can't avoid buying soft drinks in single use containers, try to buy large-sized containers, and once empty, separate them from the other waste in order to recycle them in the yellow recycling container.

· When you shop, bring your own shopping basket, trolley or cloth bag from home. In this way you will avoid going back home with many plastic bags in tow.

Use traditional plates, utensils and cups, and decorate the table with party tablecloths and napkins

· Use the same plates, cups and utensils that you use every day to serve food on the day of the celebration.

· Avoid serving food on disposable plates and drinks in disposable cups.

· Use cloth tablecloths and napkins. If you don't have enough napkins you can buy some that are made from recycled material.

Source: Agenda 21 Barcelona.