LESSON 9: PLASTICS (by courtesy of A. Rozkošná)

I. In your paris dicsuss the questions below:

a) Think of objects which, a few years ago, were made of other materials and which are now commonly made of plastics *(E.g. A water bottle was made of glass, but now it is made of plastics).*
b) Try to compare: plastics and wood, plastics and glass. What are the advantages of the plastic over the other material? Give reasons why the plastics are now used.
c) Imagine you would have to spend one week without plastics. What would you miss most?
d) Do you prefer to drink wine from glass or from plastic? Do you prefer to drink beer from plastic, from a metal can or from glass? Why?
e) Do you know any disadvantages or problems related to using plastics? Do you think using plastics can be harmful (dangerous) for humans, animals or the environment? How?
f) What are plastics made from? Is there any problem with this resource? How are the plastics made?
g) What can we do with plastic waste? Do you sort out waste? What materials can we recycle?

Useful phrases:

Talking about ADVANTAGES ×	**DISADVANTAGES**
One advantage of *Another point in favour of X is* *One other advantage of*	*One disadvantage of* *Another point against X is* *One other disadvantage of*

Giving REASONS :

There are many reasons why …	
The first reason why … is …	*First of all …*
The second reason why … is …	*Secondly …*
	Furthermore … / What is more …

II. Listening (Voice of America):NEW FINDINGS ABOUT A CHEMICAL IN PLASTICS[2]

Vocabulary:

unsafe level (in the urine) (adj+n)	nebezpečná hladina chemikálie (v moči)
within the limits (prep+n)	v rámci limitů
twice as likely	dvakrát více pravděpodobný
swallow (v)	spolknout
cause of these conditions (n+n)	příčina těchto stavů
safety research (adj+n)	výzkum bezpečnosti
Findings must be reproduced.	Výsledky zkoumání musí být zopakovány.

1. Listen to the news article and answer these questions:

a) What products may contain Bisphenol A?
b) How can people be exposed to BPA?
c) What diseases may be caused by this chemical?
d) How many people participated in the study?
e) Who was the leader of the research?
   Where was he from?
f) Where was the study published?

2. Now listen to the middle part and fill in the gaps (1.03 – 1.50)

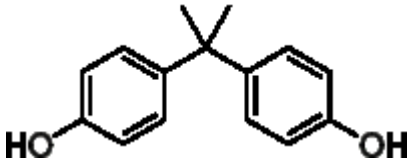
The scientists are studying the chemical BPA (Bisphenol A), which is used to make hard, polycarbonate plastics.

Researchers divided almost one thousand five hundred American adults into four groups based on BPA …….. in their urine. All the levels were within the limits …….. safe by the United States Food and Drug Administration. Yet the ……. …….. found that the highest group was more than twice as likely as the ……. group to have heart disease or diabetes, or both.

The Food and Drug Administration and chemical …….. officials said the study does not show that bisphenol A …… the diseases.

3. Speaking. Work in pairs. Summarize the main points of the news article.

Canadian Environment Minister John Baird, left, and Health Minister Tony Clement hand out baby bottles that are free of BPA. In April, Mister Clement announced Canada's plans to limit use of the chemical.



Bisphenol A

III. Reading: PLASTICS FROM ORANGES[3]

Vocabulary: Do you know these expressions?

catalyst (n) – katalyzátor
pump CO_2 in the atmosphere (v+n) – vhánět CO_2 do atmosféry
derivative (n) – derivát
building block (adj+n) – stavební jednotka
carbon-based compound (adj+n) – sloučenina na bázi uhlíku
disposable products (adj+n) – produkty na jedno použití
renewable resources (adj+n) – obnovitelné zdroje

readily abundant (adv+adj) – snadno dostupný
investigate (v) – zkoumat, vyšetřovat
petroleum / crude oil (n) – ropa
greenhouse gas (adj+n) – skleníkový plyn
emit (v) – vysílat, vyzařovat
fossil fuels (adj+n) – fosilní paliva
deforestation (n) - odlesňování

1. Read the text quickly. What is the main topic of the text?

a) Creation of a new polymer
b) Using carbon dioxide
c) Research into household cleaners
d) Disposable plastic products

PLASTICS FROM ORANGES[4]
(BBC News)

Cornell University researchers created a novel polymer using CO_2, an oil present in orange peel and a catalyst that speeds the reaction along.

The team hopes CO_2 could one day be collected for making plastics instead of being pumped into the atmosphere.

Details of the research were published in the Journal of the American Chemical Society.

Plastics are polymers, long-chained carbon-based (organic) molecules.

Limonene is a carbon-based compound that makes up about 95% of the oil in orange peel and is used to give household cleaners their citrus smell.

Geoffrey Coates, a professor of chemistry at Cornell in Ithaca, US, and colleagues used a derivative of this oil called limonene oxide as one of the building blocks for their polymer.

The researchers used a helper molecule, or catalyst, to get the limonene oxide to react with CO_2 and form a new polymer called polylimonene carbonate.

1 This polymer has many of the characteristics of polystyrene, which is used in numerous disposable plastic products.

2 "Almost every plastic out there, from the polyester in clothing to the plastics used for food packaging and electronics, goes back to the use of petroleum as a building block," said Professor Coates. "If you can get away from using oil and instead use readily abundant, renewable and cheap resources, then that's something we need to investigate.

3

4

5 What's exciting about this work is that from completely renewable resources, we were able to make a plastic with very nice qualities."

6 Coates' team is interested in using carbon dioxide as an alternative building block for polymers in industry. The gas could be isolated and used to produce plastics such as polylimonene carbonate.

7 CO_2 is the principal greenhouse gas caused by human activities, and is emitted by fossil fuel burning and deforestation.

8

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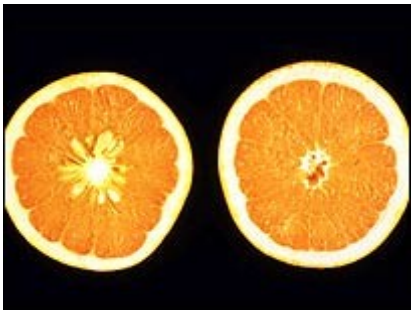

2. Complete the table below. Ask a question for each item in the table and answer it.

	Question:	**Answer:**
Researchers Based at (Place):		
Research Reported in (Magazine):		
Research Led by (Scientist):		
Name of New Plastic:		

3. Now decide if these sentences are true or false. If it is false, say what is true.

a) The scientists used CO_2, an oil present in orange peel and a catalyst to produce the new plastic. T/F

……

b) Limonene makes up 95% of the new plastic. T/F

……

c) Polylimonene carbonate gives household cleaners their citrus smell. T/F

……..

d) The new polymer is similar to PVC. T/F

……

e) The building block of most plastics is petrol. T/F

……

f) The new plastic is made of renewable resources. T/F

……

g) CO_2 is emmited during deforestation. T/F

……

IV. Read the text again. Find the English equivalents of the expressions below:

a) katalyzátor urychlí reakci
b) dlouhé řetězce molekul
c) četné výrobky z plastů na jedno použití
d) mít zájem využít oxid uhličitý

e) velmi pěkné vlastnosti
f) nejdůležitější skleníkový plyn
g) způsobený činností člověka

V. Speaking.
Work in pairs. Without looking at the text, summarize the main points of the article.

Limonene is an oil in orange peel and can be used to make polymers…

Vocabulary – Week 10 (Plastics)

advantages of plastics over another materials	výhody plastů oproti jiným materiálům
One advantage of X is	Jedna výhoda X je …
Another point in favour of X is …	Další bod ve prospěch X je …
Another point against X is …	Další bod proti X je …
One other disadvantage of X is	Daší nevýhoda X je …
give reasons why …	uvést důvody proč …
There are many reasons why …	Je mnoho důvodů proč …
The first reason why … is …	První důvod proč … je …
The second reason why … is …	Druhý důvod proč … je …
First of all …	Nejprve
Secondly …	Za druhé
Furthermore … / What is more …	Navíc …
biodegradable (adj)	biologicky rozložitelný
carcinogenous (adj)	karcinogenní
sort out waste (v+n)	třídit odpad
harmful / harmless (adj)	škodlivý / neškodný
problems related to using plastics	problémy spojené s používáním plastů
health concerns (adj+n)	obavy o zdraví, obavy týkající se zdraví
unsafe level of the chemical (in the urine) (adj+n)	nebezpečná hladina chemikálie (v moči)
within the limits (prep+n)	v rámci limitů
twice as likely	dvakrát více pravděpodobný
swallow by accident (v+n)	náhodou spolknout
cause of these conditions (n+n)	příčina těchto stavů
Findings must be reproduced.	Výsledky zkoumání musí být zopakovány.
safety research (adj+n)	výzkum bezpečnosti
catalyst speeds the reaction along	katalyzátor urychlí reakci
pump CO_2 in the atmosphere	vypouštět CO_2 do atmosféry
derivative (n)	derivát
nice qualities / properties (adj+n)	pěkné vlastnosti
building block (adj+n)	stavební jednotka

carbon-based compound (adj+n)	sloučenina na bázi uhlíku
long-chained molecules (adj+n)	dlouhé řetězce molekul
numerous disposable plastic products	četné výrobky z plastů na jedno použití
use renewable resources (v+adj+n)	využít obnovitelné zdroje
readily abundant (adv+adj)	hojné, ihned k použití
investigate (v)	vyšetřit, prozkoumat
petroleum (n) / crude oil (adj+n)	ropa
principal greenhouse gas (adj+n+n)	nejdůležitější skleníkový plyn
emit (v)	vysílat, vyzařovat
fossil fuels (adj+n)	fosilní paliva
deforestation (n)	odlesňování, deforestace
be interested in using carbon dioxide	mít zájem využít kysličník uhličitý
caused by human activities	způsobený činností člověka

Sources: [1] **Adapted from:** John and Liz Soars, Mike Sayer. *New Headway Pre-Intermediate.* OUP 2000.
[2] **Available at** http://news.bbc.co.uk/1/hi/sci/tech/4191737.stm. Accessed December 11 2009.
[3] **Based on** *Plastics from Oranges* - Handout by Mária Sabolová
[4] **Available at** http://www.voanews.com/specialenglish/2008-09-24-voa1.cfm Accessed December 11 2009.