

9. PLASTICS

1. Speaking. Read these questions. You can consult their meaning in pairs.

- Do you know what kind of compounds are plastics? Do you know any types and chemical names of plastics? (think of the floor, clothes ...)
- What are plastics made from? Is there any problem with this resource? How are they made?
- What are the typical properties of plastics? Are they usually solid/fluid, brittle/tough, soft/hard, rigid/flexible, smooth/rough, opaque/transparent or soluble/insoluble?
- Look around you. Can you name 3 things made completely or mostly of plastic? Now think of an object which, a few years ago, was made of other materials and which is now commonly made of plastics (E.g. A water bottle was made of glass, but now it is made of plastics). What was the original material?
- 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.
- Imagine you would have to spend one week without plastics. What would you miss most?
- 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?
- 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? Can you explain these terms: biodegradable, carcinogenous?
- What can we do with plastic waste? Do you **sort out waste**? What materials can we recycle?

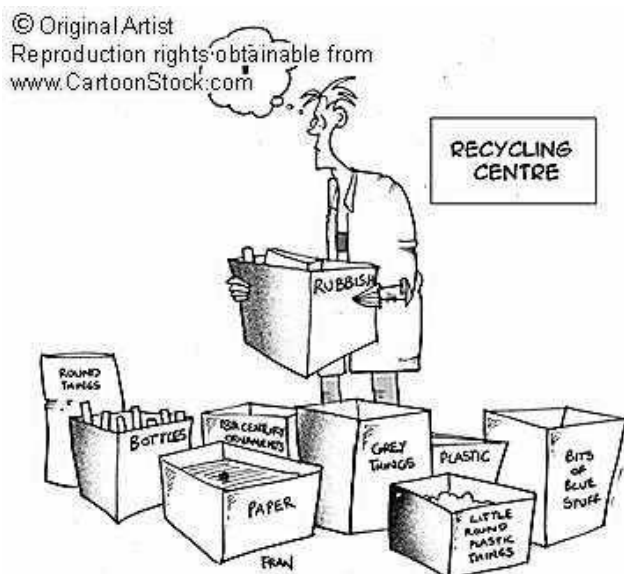
Now talk about these questions in small groups.

Useful phrases:

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

Giving REASONS :

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



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LISTENING (Voice of America)
NEW FINDINGS ABOUT A CHEMICAL IN PLASTICS²

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

Vocabulary:

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

2. Listen to the news article and answer this question:

- a) What diseases may be caused by this chemical?

3. Are these sentences true or false? If they are false, say what is true.

1. The chemical is often used in baby bottles. T/F
2. People can swallow this chemical by accident. T/F
3. Researchers found unsafe levels of the chemical in some people's urine. T/F
4. The study was led by a researcher from the University of Exeter. T/F
5. The study was published in The Journal of British Medical Association. T/F

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

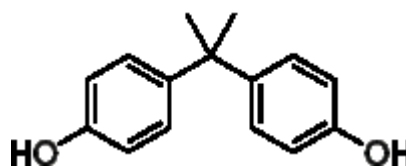
Researchers divided almost one thousand five hundred American adults into four groups based on BPA in their urine. All the levels were within the limits safe by the United States Food and Drug Administration. Yet the found that the highest group was more than twice as likely as the group to have heart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

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

5. 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

Reading: PLASTICS FROM ORANGES³

Vocabulary: Do you know these expressions?

catalyst (n) – katalyzátor	readily abundant (adv+adj) – snadno dostupný
pump CO ₂ in the atmosphere (v+n) – vhánět CO ₂ do atmosféry	investigate (v) – zkoumat, vyšetřovat
derivative (n) – derivát	petroleum / crude oil (n) – ropa
building block (adj+n) – stavební jednotka	greenhouse gas (adj+n) – skleníkový plyn
carbon-based compound (adj+n) – sloučenina na bázi uhlíku	emit (v) – vysílat, vyzařovat
disposable products (adj+n) – produkty na jedno použití	fossil fuels (adj+n) – fosilní paliva
renewable resources (adj+n) – obnovitelné zdroje	deforestation (n) – odlesňování

6. Read the text quickly and decide what is the main topic of the text:

- a) Creation of a new polymer
- b) Recycling plastics
- c) Research into household cleaners
- d) Disposable plastic products

7. 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:		

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

a) The scientists used CO₂, 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 building block of most plastics is petrol. T/F

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

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

.....
g) CO₂ is emitted during deforestation. T/F

9. Translation

Translate the underlined sections of the text into Czech / Slovak.

10. Complete the gaps in this text with expressions from the article.

US scientists have _____ a way to make plastics from orange peel, using the greenhouse gas carbon dioxide. Cornell University researchers created a novel polymer using CO₂, an oil present in orange peel and a catalyst that _____ the reaction along. The team hopes CO₂ could one day be _____ for making plastics instead of being pumped into the atmosphere.

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

Limonene is a carbon-based _____ 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 _____ blocks for their polymer. The researchers used a helper molecule, or _____, to get the limonene oxide to react with CO₂ and form a new polymer called polylimonene carbonate.

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

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 oxide. CO₂ is the principal greenhouse gas _____ by human activities, and is emitted by fossil fuel burning and deforestation.

11. Speaking.

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

PLASTICS FROM ORANGES⁴

(BBC News)

<p><u>Cornell University researchers created a novel polymer using CO₂, an oil present in orange peel and a catalyst that speeds the reaction along.</u></p>	1	This polymer has many of the characteristics of polystyrene, which is used in numerous disposable plastic products.	8
<p><u>The team hopes CO₂ could one day be collected for making plastics instead of being pumped into the atmosphere.</u></p>	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.”	9
<p>Details of the research were published in the Journal of the American Chemical Society.</p>	3		
<p><u>Plastics are polymers, long-chained carbon-based (organic) molecules.</u></p>	4		
<p>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.</p>	5	What’s exciting about this work is that from completely renewable resources, we were able to make a plastic with very nice qualities.”	10
<p>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.</p>	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.	11
<p><u>The researchers used a helper molecule, or catalyst, to get the limonene oxide to react with CO₂ and form a new polymer called polylimonene carbonate.</u></p>	7	CO ₂ is the principal greenhouse gas caused by human activities, and is emitted by fossil fuel burning and deforestation.	12



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

12. HOMEWORK⁵: FUTURE – BUDOUCNOST

FUTURE SIMPLE

will/shall+ infinitiv

Tento tvar se používá pro vyjádření prostého děje děje budoucího, např. když se o činnosti rozhodneme v momentě mluvení:

- What would you like to drink? – **I'll have** an orange juice, please.
nebo když předvídáme, co se stane – s výrazy *probably, I expect, I'm sure, I think*
- Do you think Ann will pass the exam? – Yes, I'm sure **she will pass** easily.
nebo když nabízím, že něco budu dělat/ žádám někoho, aby něco udělal:
- That bag is too heavy. **I'll help** you with it. / **Will you shut** the door, please?

Shall se běžně pro vyjádření budoucnosti v hovoru nepoužívá, je to spíše tvar objevující se v psaném projevu. Dnes se spíše objevuje ve významu „Mám to udělat?“ nebo ptám-li se na něčí názor nebo dávám-li návrh.

- **Shall I close** the door?
- I have no money. What **shall I do**?
- Where **shall we go** this evening?

FUTURE CONTINUOUS

Průběhový tvar will being se použije, chceme-li vyjádřit že v určitou dobu nebo po určité době v budoucnosti:

- Don't phone between 7 and 8. **We will be having dinner** then.
- This time next week **I'll be lying** on a beach.

JINÉ ČASY K VYJÁDŘENÍ BUDOUCNOSTI

Přítomný čas prostý (present simple) se používá k vyjádření budoucnosti, když je řeč o jízdách řádech, programech kin, televize, atd.:

- **The train leaves** at 10:00 and **arrives** at 12:30.
- What time **does the film begin**?

Jinak mluvíme-li o činnostech, které jsme si **zařídili**, o kterých víme, že je budeme v budoucnu dělat, používáme **průběhový tvar přítomného času (present continuous)**

- What **are you doing** on Saturday evening? – **I'm going** to the theatre.
- **I'm not working** tomorrow, so we can go somewhere.

V těchto větách lze použít i konstrukci **be going to** (What are you going to do on Saturday evening? – Co hodláš dělat...), ale přítomný čas průběhový je tu přirozenější.

Rozdíl mezi použitím průběhového tvaru a konstrukce **be going to** je následující: Použitím průběhového tvaru spíše naznačím, že je něco už zařízeno, domluveno, použitím konstrukce **be going to** spíše naznačím, že jsem se rozhodla něco udělat, mám to v úmyslu, ale nemusím to mít zařízeno.

- **I'm leaving** tomorrow, I've got my plane tickets.
- The windows are dirty – Yes, I know, **I'm going to clean** them later.

Další použití be going to:

v případech, kdy říkáme, že se něco stane, protože situace to mu nasvědčuje:

- The man can't see where he's walking. There's a hole in front of him. **He's going to fall** into the hole.
- Look at those black clouds. **It's going to rain**.

EXERCISES:

A. Dejte sloveso do tvaru přítomného času prostého nebo průběhového.

- 1) I'm going. (go) to the theatre this evening.
- 2) Does the film begin (the film / begin) at 3:30 or 4:00?
- 3) We..... (have) a party next Saturday. Would you like to come?
- 4) The art exhibition(open) on 3 May and(finish) on 15 July.
- 5) I(not / go) to a concert tonight. It(begin) at 7:30.
- 6) You are on a train to London and you ask another passenger: Excuse me, what time(this train / get) to London?
- 7) You are talking to Ann: Ann, I(go) to town.(you / come) with me?

B. Odpovězte na otázky. Všechny ty věci se chystáte udělat, ale ještě jste je neudělali

- 1) Have you cleaned the car? – (tomorrow) Not yet, I'm going to clean it tomorrow.
- 2) Have you phoned Sally? – (later) Not yet.
- 3) Have you done the shopping? – (this afternoon) Not yet.
- 4) Have you read the paper? – (after dinner) Not yet.

C. Co se nejspíš v těchto situacích stane? Použijte slova v závorkách

- 1) There are a lot of black clouds in the sky. (rain) It's going to rain.
- 2) It is 8:30. Jack is leaving the house. He has to be at work at 8:45, but the journey takes 30 minutes. (late) He
- 3) There is a hole in the bottom of the boat. A lot of water is coming in through the hole. (sink) The boat

D. Který výraz je správný?

- 1) Did you phone Ruth? – Oh, no, I forgot. ~~I phone~~ / I'll phone her now.
- 2) I can't meet you tomorrow afternoon. I'm playing / I play tennis.
- 3) I meet / I'll meet you outside the hotel in half an hour, OK? – Yes, that's fine.
- 4) Remember to buy a newspaper when you go out. – OK, I don't forget, / I won't forget.
- 5) What time does your train leave / will your train leave tomorrow?
- 6) I don't want to go out alone. Do you come / Will you come with me?
- 7) It's a secret between us. I promise I don't tell / I won't tell anybody.

E. Který tvar je správnější nebo běžnější?

- 1) Ann isn't free on Saturday. ~~She'll work~~ / She's working.
- 2) I'll go / I'm going to a party tomorrow night. Would you like to come too?
- 3) I think Jane will get / is getting the job. She has a lot of experience.
- 4) I can't meet you this evening. A friend of mine will come / is coming to see me.
- 5) There's no need to be afraid of the dog. It won't hurt / it isn't hurting you.
- 6) Tomorrow at this time I will eat / will be eating spaghetti.
- 7) Look at the clouds. It will/is going to snow.

Vocabulary – Week 9 - 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)	třídít 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 (v)	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)	hojně, 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.

⁵ Raymond Murphy: *English Grammar in Use (A self-study reference and practice book for intermediate students)*, second edition, Cambridge University Press 1994.

Lesson adapted from Marie Sabolová.