

## PLASTICS

- I. **Think of pros and cons of using plastics.** Discuss it with your partner, use the phrases below:

*The reason why we  
 should use...is*                      *shouldn't use...is*  
*Another point  
 in favour of...*                      *against....*  
*One/one other advantage (of...) is*                      *One/one other disadvantage (of...) is*  
*Arguments for/ Arguments in support...*                      *Arguments against...*

Pros and cons in other words:

| PROS   | CONS  |
|--|---|
| good points, pluses, positive aspect, advantage, positive point, positive consequence, benefit | bad points, minuses, disadvantage, drawback, negative effect, negative consequence, demerit |

- II. **Academic vocabulary: put the verbs in brackets into the right form, adding a preposition if necessary. Then, complete the gaps with the words from the box (there are three too many).** <http://science.howstuffworks.com/plastic.htm>

|            |           |             |           |            |          |
|------------|-----------|-------------|-----------|------------|----------|
| disposal   | occurring | bases       | compounds | variety    | infinite |
| properties | yielding  | significant | items     | dissolving | factors  |

Plastics are everywhere. While you're reading this article, there are probably numerous plastic <sup>1</sup>\_\_\_\_\_ within your reach (your computer, your pen, your phone). A plastic is any material that can be shaped or molded into any form - some are naturally <sup>2</sup>\_\_\_\_\_, but most are man-made.

Plastics **(make)**\_\_\_\_\_ oil. Oil is a carbon-rich raw material, and plastics are large carbon-containing <sup>3</sup>\_\_\_\_\_. They're large molecules called polymers, which **(compose)**\_\_\_\_\_ repeating units of shorter carbon-containing compounds called monomers. Chemists combine various types of monomers in many different arrangements to make an almost <sup>4</sup>\_\_\_\_\_ variety of plastics with different chemical <sup>5</sup>\_\_\_\_\_. Most plastic is chemically inert and will not react chemically with other substances - you can store alcohol, soap, water, acid or gasoline in a plastic container without <sup>6</sup>\_\_\_\_\_ the container itself. Plastic **(can mold)**\_\_\_\_\_ an almost endless <sup>9</sup>\_\_\_\_\_ of shapes, so you can find it in toys, cups, bottles, utensils, wiring, cars, even in bubble gum. Plastics have revolutionized the world.

Because plastic **(not/react chemically)**\_\_\_\_\_ most other substances, it doesn't decay. Therefore, plastic disposal poses a difficult and <sup>8</sup>\_\_\_\_\_ environmental problem. Plastic hangs around in the environment for centuries, so recycling is the best method of <sup>10</sup>\_\_\_\_\_. However, new technologies are being developed to make plastic from biological substances like corn oil. These types of plastics would be biodegradable and better for the environment.

The monomers that (**find**) \_\_\_\_\_ many plastics include organic compounds like *ethylene, propylene, styrene, phenol, formaldehyde, ethylene glycol, vinyl chloride* and *acetonitrile*. Because there are so many different monomers that can combine in many different ways, we can make many kinds of plastics. Another way that monomers can combine (**form**) \_\_\_\_\_ polymers is through addition reactions. Addition reactions involve (**rearrange**) \_\_\_\_\_ electrons of the double bonds within a monomer to form single bonds with other molecules.  
(adapted from Daniela Dlabolová)

### III. Read the text about bioplastics

- a) translate the underlined words/phrases into Czech
- b) prepare 5 questions to ask your partner.

**Bioplastics** are plastics derived from renewable biomass sources, such as vegetable fats and oils, corn starch, pea starch or microbiota. Bioplastic can be made from agricultural byproducts and also from used plastic bottles and other containers using microorganisms. Some, but not all, bioplastics are designed to biodegrade.

Bioplastics are used for disposable items, such as packaging, crockery, cutlery, pots, bowls, and straws. They are also often used for bags, trays, fruit and vegetable containers and blister foils, egg cartons, meat packaging, vegetables, and bottling for soft drinks and dairy products.

These plastics are also used in non-disposable applications including mobile phone casings, carpet fibres, insulation car interiors, fuel lines, and plastic pipng. New electroactive bioplastics are being developed that can be used to carry electrical current. In these areas, the goal is not biodegradability, but to create items from sustainable resources.

Medical implants made of PLA (polylactic acid), which dissolve in the body, can save patients a second operation. Compostable mulch films can also be produced from starch polymers and used in agriculture. These films do not have to be collected after use on farm fields.

At one time bioplastics were too expensive for consideration as a replacement for petroleum-based plastics. The lower temperatures needed to process bioplastics and the more stable supply of biomass combined with the increasing cost of crude oil make bioplastics' prices more competitive with regular plastics.



IV. Watch the video [http://www.ted.com/talks/mike\\_biddle](http://www.ted.com/talks/mike_biddle) and answer the questions below:

1. What are “above-ground mines”? Why does Biddle call them this way?
2. How much of the plastics is recovered and reused? What happens to the rest?
3. Why is it difficult to recycle plastics?
4. What are the results of the lack of recycling policies in the US?
5. What does recycling in underdeveloped countries look like?
6. What kind of solutions are they?
7. How do people separate plastics in Bombay?
8. What are the advantages of Biddle’s technique of recycling plastics?
9. What is the process itself?

V. Complete the table with the words from the list:

polystyrene, high density, shower curtains, melts at higher temperature than polythene, food bags, low density, polyvinyl chloride, fibres for carpets, styrofoam, thermal insulator

| Name                    | Example    | Properties  | Uses   |
|-------------------------|------------|---|--|
| polyethane,<br><u>A</u> | polythene  | soft, waterproof  | <u>B</u>   |
| polythene<br><u>C</u>   | polythene  | hard, tough,<br>waterproof                              | jugs, bowls,<br>containers                                     |
| polypropene             | propathene | <u>D</u>  | Dashboard, food<br>pots, <u>E</u>                              |
| <u>F</u>                |            | rigid, transparent                                      | food containers  |
| polystyrene foam        | <u>G</u>   | very light,<br><u>H</u>                                 | refrigerators, air<br>conditioners,<br>protective<br>packaging |
| <u>I</u>                | PVC        | Rigid, waterproof,<br>can be made softer<br>and pliable | Pipes, bottles,<br>raincoats,<br><u>J</u>                      |

VI. What can we personally do to minimize gyres of plastics in the oceans or landfills?