Synthèse du CLES

Main idea
On the whole, plastic seems to have raised many health and environmental issues, leading to heated controversial debates among scientists and between the latter and the industry.

1. From an environmental point view

- People are hostile to plastics for the petroleum used to produce it, for the litter it becomes, for the space it takes up in landfills, and the damage it can do in oceans.
- Consequence: The plastics industry has faced some 400 pieces of anti-plastics legislation in the US.

Conversely, the legislative debate has given birth to articles and presentations focusing on the advantages of plastics and on how it will improve the quality of our daily lives.

Here are some positive examples

1. Plastics are durable, convenient, and inexpensive to manufacture; innovative new plastic packaging is actually more energy-efficient than other alternatives and helps users reduce, not increase, their carbon production.
2. Replacing the plastic packaging in use would use four times as much material from other sources, like paper or aluminium.
3. Plastic is lightweight: 30 percent lighter than paper carton.
4. Less packaging means less waste and less energy spent on transport.
5. Plastics are recyclable, able in most cases to be used over and over again.

Some significant figures

The plastics industry in the USA accounted for $268 billion.

It requires 169 million barrels of oil to make plastic. (Less than 3 percent of total oil consumption)

Debate should focus on more efficient ways of recycling than on banning plastics

In 2006, Americans consumed more than 29 million tons of plastic, but recycled just 2 million tons of it, a paltry 7 percent.

Some scientists have come to change their minds .as to the danger of plastics.

The benefits of plastics

It should be mentioned here that the benefits are pointed out by the plastics industry, and the ACC (The American Chemistry Council) have also used the following arguments to make a case for the industry in recent months.

Plastics : an asset for the future: Some innovations

1. Cameleon clothing for the army: invisibility
2. Medicine angioplasty
3. Artificial skin
4. Electronic books
5. Plastic computers in the future
6. Any shape and size
7. Wallpaper with variable pictures

However the student must point out the controversy surrounding the use of plastics and especially BPA in food containers and baby bottles.

2. Health issues: BPA is a simmering controversy
Plastics and mainly one of its components, BPA, is raising "some concerns". It may be a serious threat for health.

A- Recent research on mice seems to indicate precaution.

1. Infants are the most exposed and suffer the most.
2. Danger of cancer later in life.
3. Interfere with development
4. 38 independent specialists in BPA toxicity from around the world concluded that BPA presents a clear risk to human health.
5. Alarming findings of a scientific study on the danger of BPA: List of health risks when exposed to very low doses of BPA: Low sperm count, hyperactivity, early puberty, obesity, small testes size, and enlarged prostates.

Research conducted by Dr Hunt reveals that exposure to BPA show damage in egg cells of female mice: when they try to divide, their chromosomes don't line up right .

It takes a very low dose to cause these effects. This is the reason why these experiments are carried out on animals.

Whence the importance of defining low dose. See doc 7

Many of the laboratory studies explored effects on offspring of pregnant rodents receiving the so-called"low doses" of bisphenol A (< 5 mg/kg body weight/day), and including studies performed with much lower doses during critical periods of development. In the months since release of the NTP-CERHR report, the literature on exposures and potential human health effects of bisphenol A has continued to grow, raising public concern and generating more questions.
More that 40 studies have confirmed the danger of using polycarbonate plastics.

B- Other studies deny the potential for low levels of BPA to migrate from polycarbonate products into foods and beverages (generally less than 5 parts per billion). the estimated dietary intake of BPA from polycarbonate is less than 0.0000125 milligrams per kilogram body weight per day. This level is more than 4000 times lower than the maximum acceptable or "reference" dose for BPA of 0.05 milligrams per kilogram body weight per day established by the **U.S. Environmental Protection Agency.**
The European Commission's Scientific Committee on Food (SCF) has also estimated total dietary intake of BPA from all food contact sources, including polycarbonate plastic products and epoxy resin coatings, to be in the range of 0.00048 to 0.0016 milligrams per kilogram body weight per day, which is below the Tolerable Daily Intake set by the SCF of 0.01 milligrams per kilogram body weight per day.
FDA's assessment of chemical bisphenol A as safe at current levels of exposure.

Controversy over BPA has reached new heights in recent months.

1. **Risks are not scientifically assessed according to some experts**
    - 38 independent specialists in BPA toxicity from around the world concluded that BPA presents a clear risk to human health.

- The analysis shows that the CERHR panel's assessment of BPA utterly fails to meet basic, universally understood standards for scientific reviews and data quality. These standards require that assessments be accurate, unbiased, consistent, complete, and conducted by those with the necessary expertise to ensure objectivity.
- The review reveals that the CERHR assessment might contain nearly 300 errors of fact and interpretation; is **biased, inconsistent, incomplete**, and clearly fails to meet the most basic scientific standards.
- Biased. The assessment heavily favours industry studies over government and independent studies.

The objectivity of the CERHR assessment is compromised by CERHR contractors' potential conflicts of interest. The accuracy and consistency of the CERHR assessment is compromised by the panel's lack of organization. The objectivity, accuracy, and consistency of the CERHR assessment is compromised because it has not been subjected to a standard peer review.

Some questions.

1. **What are the economic interests at stake?**
2. **What relationship exists between the findings of researchers and the financing of research? In you opinion is research always dependent on the funder?**
3. **Do you agree with the positive points concerning plastics and the environment?**
4. **Which material could ecologically replace plastics? In every field of human activity?**
5. **Explain what is meant by top down and bottom up (approach) in document 7.**
6. **To what extent is the principle of precaution a valid action to take concerning plastics and food?**