

OVERVIEW OF THE TASK

Plastics

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| Target audience: | 2 nd year of the cycle in Science and Technology and Environmental Science and Technology |
| Team or individual work: | Individual and in teams of two |
| Class time required: | 3 - 75 minute periods |

Educational Aim:

Lead the students to reflect upon materials, their energy consumption during transformation and their impact on the environment.

Allow the student to become familiar with the use of plastics and their classification as well as the processes involved in their manufacture, all in the context of sustainable development and environmental protection.

Our lifestyle habits and industrial processes in 2007 are far removed from those of 100 years ago. We are in an age of speed (production, transportation, work, food, etc.) This rhythm of life makes us forget that as a society we are responsible for the upheavals with which we are now faced.

NOTE: This LES was designed within the framework of training sessions for personnel in science and technology. It will require adaptation before being used with students.

Targeted disciplinary competencies:

Competencies C-2 and C-3 are targeted in this LES.

The student must become familiar with all the facets of the usage of plastics in order to build his opinion on the initial question: Are plastics a good material?

C-2: All the components are mobilised in this situation. The student must situate the problem within a social and environmental context. He must understand the scientific and technological principles related to the manufacture, transformation and management of residual materials of plastics.

C-3: All the components are mobilised in this situation. Each student must produce a mini memoir on the question in which he must communicate his information to the public.

Targeted cross-curricular competencies:

C-3 Exercises his critical judgement.

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| Broad Area of Learning | <p>Environment and consumption <i>Axis of development:</i> -Responsible use of goods and service:</p> <ul style="list-style-type: none"> • Knowledge of the relationship between production and consumption; • Concern for making informed choices in terms of consumption; • Concern for integrated management of resources and waste; • Concern for the consequences of the use of science and technology; <p>- Construction of a healthy environment in terms of sustainable development :</p> <ul style="list-style-type: none"> • Concern for the rational use of resources • Concern for the integration of environmental values in the production processes of goods and services. |
| Involved worlds and compulsory concept(s) | <p>Technological World: - Materials: Plastics (thermoplastics and thermosetting plastics) - Their properties - Modifications of properties - Manufacturing: (shaping, fabrication)</p> <p>Materiel World: - Material organisation (macromolecules) - Energy efficiency - Archimedes' Principle (AST)</p> <p>Earth and Space: - Lithosphere : energy resources - Carbon cycle</p> <p>Living World: - Ecological footprint</p> |
| Community resources | Recyc-Québec Bruntland Report (1987) History of plastics Oil: Refinery processes Industrial revolution Production chain |
| Stages | <p>The stages of opinion building as well as a part of the technical analysis stage are at the heart of this LES.</p> <p>The student is led to take position, to validate his opinion using scientific and technological facts and to build his knowledge through various pedagogical activities.</p> <p>Each activity that makes up the LES will allow him, in varying degrees, to build his opinion and to back it up using his newly acquired knowledge and previously learned facts.</p> |
| Strategies, attitudes and techniques | <p>Exploration strategies: - List the greatest possible number of scientific, technological and contextual facts that could be useful in defining a problem;</p> |

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| | <p>-Envisage various points of view related to the problem.</p> <p>Analysis strategies:</p> <ul style="list-style-type: none"> - Determine the constraints and the elements critical to the resolution of the problem; - Call upon different types of reasoning to treat the information. <p>Attitudes :</p> <ul style="list-style-type: none"> - Interest in confronting ideas - Intellectual rigor - Concern for precision measuring - Methodical work ethic - Concern for the correct and precise use of language - Respect for life and for the environment - International solidarity regarding topical issues <p>Techniques :</p> <ul style="list-style-type: none"> - Safe use of laboratory material - Verification of the integrity, correctness and sensitivity of measurement instruments - Interpretation of the results of the measurement (significant figures, errors related to measurement) |
| <p>Possible evaluation:</p> <p>This type of task allows for the evaluation of C-2 and C-3.</p> | |
| <p>Global context:</p> <p>The student is faced with a recycling bin filled with various plastic objects. (Packaging, common objects and containers). He is given a booklet in which we ask the question: « Are plastics a good material? »</p> | |