



Unit Description

Title	<i>Environmental issues – Recycling materials</i>
Age of students/grade	12-13 years (2 nd or 3 rd year in Lower Secondary School)
Length of the unit	1-2 lessons (45-50 minutes each)
Mathematical topic	Applying Mathematics in real-world problems – it deals with many mathematical skills as reading and interpreting graphs with data, using percentages, working with different units of measurement, using very high numbers where scientific notation is used
Prerequisite knowledge	<ul style="list-style-type: none">Percentages (using proportions in a proper way in order to calculate rate, value, starting value, percentage increase)Knowing the most important graphs where they can represent numerical data (hystogram and bar chart, pie chart, tables)
Materials needed	<ul style="list-style-type: none">StationeryTape measure
Objectives	<ul style="list-style-type: none">Improving text understanding.Applying Mathematics in real-world problems.Strengthening students' ability to collaborate with each other to tackle complex tasks.
Notes on work with migrant students	<ul style="list-style-type: none">Starting with brainstorming about environmental issue and check wheter the matthematical data in the article proposed have been understood by the students or there are technical words which are difficult or even unknown. These words could be written on the blackboard where they can easily be seen during the lesson.Working on reality tasks will be developed in small groups in order to foster students' involvement and social relationships.At the end of the activity, the students will show the results in front of the whole class and will add, if it is profitable, something about their own personal experience.

Lesson plan:

Step 1- Brainstorming and choice of the article or another scientific text which deals with an environmental topic chosen by the students

Here there are some links of articles about environment which can be used:

- <https://www.ecodallecitta.it/i-dati-eurostat-sul-riciclo-imballaggi-plastica-eurostat/>

It deals with recent European data about packaging waste, its type, its distribution.

- <https://quifinanza.it/green/consumo-medio-acqua-quanto-ammonta/508463/>

It deals with the use of water per person and it helps to raise awareness of a more conscious use of this precious resource.

- <https://altreconomia.it/>

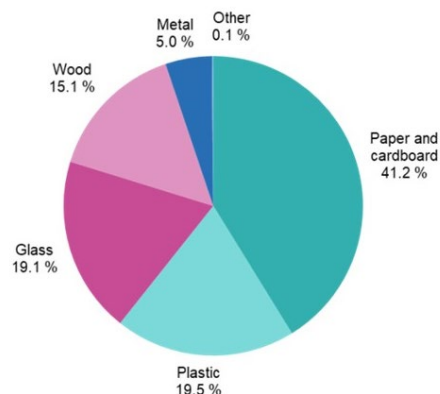
This article focuses on food waste and provides alarming data on the habits of Europeans

Step 2 - Text analysis

Starting from the article chosen, the teacher proposes some questions to which the students try to answer, working in groups.

Example developed on the topic of packaging

Packaging waste generated by packaging material,
EU estimate, 2020
(%)



Source: Eurostat (online data code: env_waspac)

eurostat 

Figura 1: Rifiuti di imballaggio generati dal materiale di imballaggio, UE, 2020
(%)

Fonte: Eurostat (env_waspac)

For example:

- ❑ How many chart types are there in the analyzed text?
- ❑ Why is the pie/circular chart used for the distribution of materials (see above) and why the bar chart for “Packaging waste generated and recycled”?
- ❑ If the total volume of packaging is 79.3 million tonnes, how many million tonnes of paper and card board waste have been produced?
- ❑ If paper and card board waste has increased by 25,2 % since 2009, how big was its production in 2009?
- ❑ The directive on packaging waste sets a target for plastics at 22.5 %. If this target will be reached, how much plastic does each one of us have to recover in a year?
- ❑ Think about your family’s daily habits.... Do you think you can achieve this goal? (Motivate and defend your answer)

Step 3 - Oral presentation to the class

All data taken from the text, which answer the guide questions proposed by the teacher or the questions asked by the students themselves, are organized in a schematic text that will then be proposed to the class with the details of the mathematical formulas used and the step by step reasoning that led to the answers. Each student can add a link, if he/she wants, with good practices of behaviour or considerations on their home country, or some improvement on their habits.