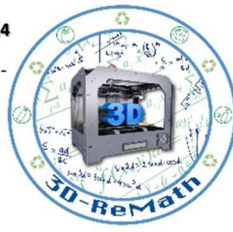




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Intellectual Output 4 Curricula on Recycling

Part A

WASTE MANAGEMENT AND RECYCLING Course Outline

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Table of contents

1. Aim of the course	4
2. Learning outcomes	4
3. Teaching and Learning Methods	4
3.1 Teaching approach	4
3.2 Delivery method	4
3.3 Sessions	4
4. Educational material (materials/sources/resources required to complete the course)	14
4.1 Keywords	14
4.2 "Flow Chart of Teaching"	14

1. Aim of the course

This course aims in introducing the main concepts of waste management and recycling while presenting practices followed “at home and at schools” in the countries and specifically the municipalities participating in the project. During the course, students will learn the importance of the hierarchy in waste management as well as the main elements of a waste management system. Terms such as reduce, reuse, and recycle will be clarified and also which are the benefits of each one.

2. Learning outcomes

The skills that students will be expected to acquire after the end of the course are:

- Understanding of waste generation and the related environmental problems
- Knowledge of waste management hierarchy
- Knowledge of current practices in the European Union and in their countries
- Knowledge of benefits related to reduce, reuse and recycle
- Familiarisation with tips on proper way to reduce, reuse and recycle at home and at school
- Raising awareness on reduce, reuse and recycle to their families
- Possible change their habits on waste management in daily life

3. Teaching and Learning Methods

3.1 Teaching approach

A comprehensive transfer of knowledge and experiences to students through mental and experiential understanding of waste management and recycling and its impact on the environment.

3.2 Delivery method

Face-to-face, distance learning and use of audiovisual material.

3.3 Sessions

- 1) Introduction in waste management
- 2) Reduce our waste
- 3) Reuse our waste
- 4) Recycle our waste
- 5) Current practices and tips
- 6) Single use plastic
- 7) Activity 1 (Monitor our waste at home)
- 8) Activity 2 (Role playing game)

Description

Definition on waste production and waste management practices in EU and each country / municipality. <https://ec.europa.eu/environment/waste/index.htm>

Waste management is the collection, transportation, recycling and final disposal of waste. This term is assigned to the material, **waste material** that is produced through our everyday activities (e.g. production and preparation of food, clothes and products). This material is managed to avoid its adverse effects over human health and environment

The European Union's approach to waste management is based on the "**waste hierarchy**" which sets the following priority order when shaping waste policy and managing waste at the operational level: prevention, (preparing for) reuse, recycling, recovery and, as the least preferred option, disposal (which includes landfilling and incineration without energy recovery).

**Important points that we need to stress:**

- Sources of wastes
 - Ask students to present different sources, (households, factories, shops, restaurants) – can they define differences between solid waste, wastewaters?
- Different types of wastes
 - Biowaste (what are, which sources?) – can the students define food-wastes and garden wastes?
<https://ec.europa.eu/environment/waste/compost/index.htm>
 - Plastics & packaging materials
https://ec.europa.eu/environment/waste/packaging/index_en.htm
 - Paper
 - Glass
 - Metals
 - Residues (leather, rubber etc)
<https://www.dep.pa.gov/Business/Land/Waste/SolidWaste/Residual/Pages/Whats.aspx>

- Wastes in numbers - How much wastes are we producing in our homes, municipality, country. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190123-1>
- Why understanding the numbers is important?
 - To understand (count) the problem of waste materials
 - To understand (count and monitor) the changes when we try new practices (reduce, reuse recycling) – using indicators. Ask students to decide on one indicator

Discuss their countries practices for both house and school.

Interaction 1. Use of questionnaires in order to compare their knowledge before and after the program. – an example is provided in Annex 1.

Session 2	Reduce our waste
Description	
<p>Definition of waste reduction / prevention and its benefits. (both terms can be used) https://ec.europa.eu/environment/waste/prevention/index.htm</p> <p>‘Prevention’ means measures taken before a substance, material or product has become waste, that reduce:</p> <p>(a) The quantity of waste, including through the reuse of products or the extension of the life span of products</p> <p>(b) The adverse impacts of the generated waste on the environment or human health; or</p> <p>(c) The content of harmful substances in materials or products</p> <p>https://ec.europa.eu/environment/waste/prevention/pdf/prevention_guidelines.pdf</p> <p>Presentation of waste reduction practices on everyday life (eg fabric bags instead of plastic bags, reusable water bottle, reusable lunch bowl, prefer bulk foods not in packages etc). Waste can be reduced by individuals, businesses, institutions such as hospitals or educational facilities, organizations, municipalities, or governmental agencies.</p> <p>Examples: “eu nao faço lixo” (or “I don’t create rubbish”) δεν παράγω σκουπίδια.</p> <ul style="list-style-type: none"> • https://ec.europa.eu/environment/waste/prevention/pdf/EuNaoFacolixo_Factsheet.pdf • https://ec.europa.eu/environment/waste/prevention/pdf/eco-sac.pdf • https://ec.europa.eu/environment/waste/prevention/pdf/Real%20Nappies_Factsheet.pdf • https://ec.europa.eu/environment/waste/prevention/pdf/Ecopoint_crai_Factsheet.pdf <p>In our daily lives is easy to avoid the use of single-use plastic products and replace them by long-lasting products.</p> <p><u>Basic topics for analysis:</u></p> <ul style="list-style-type: none"> • What is waste reduction? <ul style="list-style-type: none"> ➤ https://www.epa.gov/recycle/reducing-waste-what-you-can-do • Why is it so important? <ul style="list-style-type: none"> ➤ Reduces environmental pressures and greenhouse gases emission associated with landfill ➤ Helps sustain the environment for future generations 	

- Reduces CO₂ emissions from producing, transporting and using materials and recycling or disposing of waste materials

- Reduce food waste



https://www.eufic.org/en/food-safety/article/reducing-food-waste-yes-we-can-ga?gclid=CjwKCAjwq832BRA5EiwACvCWsUsGR8A1T8oSz636GCovf9UpkvtAlfd6p8sVB7x-YzVbnihJcSVRoCESYQAvD_BwE

- **Ask students to decide on one indicator for food waste reduction**

- Reduce packaging



(<http://www.stopwaste.org/at-home/reduce-and-reuse/reduce-packaging-waste>)

- Reduce use of resources



(<https://sciencing.com/reduce-use-natural-resources-16336.html>)

(<https://www.toppr.com/guides/science/nature/ecosystem/natural-resources-how-to-reduce-the-use-of-natural-resources/>)



European week for waste reduction

<https://www.ewwr.eu/en>

https://www.ewwr.eu/docs/case_studies/EWWR_Guide_GP_EN

Session 3	Reuse our Waste
Description	
<p>Definition: Reuse involves purchasing non-disposable items or it can mean passing an item along to another person for continued use. For example, instead of using paper towels to clean the house, you can use a washable rag; and, instead of throwing out the clothes or toys your children have outgrown, you pass them along to a neighbor, charity or church. https://www.wm.com/location/california/orange-county/newport-beach/env/reuse.jsp</p> <p>Present practices on reuse waste ways on their daily lives (eg. viewing audiovisual material with various constructions that they can make etc).</p> <p>Basic topics for analysis:</p> <ol style="list-style-type: none"> 1. What is the difference between reuse and recycling? 	

- Reusing refers to using an object as it is without treatment. This reduces pollution and waste, thus making it a more sustainable process.
 - It is not about repurposing the materials of an object (the glass of a bottle), but repurposing the very object itself (the bottle)
 - Reused items include anything that was bought second hand, often furniture and clothing
 - i. Transform empty packages to decorations
2. What can we reuse?
 - a. a computer – suggest other electric appliances?
 - b. a bag ? a jar ?
 - c. a car?
 - d. a pair of jeans?
 - **Ask the students to give an example of a material or an object that we cannot reuse - food? medical equipment?**
 3. How can we reuse our waste? What are the properties of a material / equipment that can make them reusable?
 4. Current practice in our house and school
 5. Municipal waste reuse

Examples

<http://lessismore.org/materials/30-reuse-tips/>

- **Important!** Students should be asked to distinguish the differences between reduce and reuse options.

Activity (2).

Implementation of construction with school waste as well as waste brought from home (eg damaged toys, damaged accessories etc).

Ask students to suggest ideas from videos, articles, images which involve material such as plastic bottles, cartons, old items, old clothes demonstrating how to make them useful again or ways to transform them into something completely different they will use in their daily lives.

Some ideas from youtube videos

- <https://www.youtube.com/watch?v=HhMUrdavT94>
- <https://www.youtube.com/watch?v=ZQxJ1yyTI5Q&t=738s>
- <https://www.youtube.com/watch?v=fPswCroUauA> (Kids old clothes repurpose ideas)
- https://www.youtube.com/watch?v=NwYXf_SJXSo (Cardboard)
- <https://www.youtube.com/watch?v=24zZarRmi1c>
- <https://www.youtube.com/watch?v=mSZYpQBmFsl>
- https://www.youtube.com/watch?v=Nhhcc_28dks (Old CDs)
- <https://www.youtube.com/watch?v=FrA4bDbJvJY> (How to Reuse Plastic Bottles and Make a Fish Nemo)

Ideas from articles:

- <https://www.buzzfeed.com/mallorymcinnis/teachers-are-great> (35 Cheap And Ingenious Ways To Have The Best Classroom Ever)
- https://www.boredpanda.com/plastic-bottle-recycling-ideas/?utm_source=google&utm_medium=organic&utm_campaign=organic (23 Creative Ways To Recycle Old Plastic Bottles Into DIY Crafts)

Ideas from Pinterest:

- <https://gr.pinterest.com/fabiolaolaza/recycling-projects-for-school/>

Description

Definition of recycling our waste and its benefits.

Recycling is the process of collecting and processing waste materials that would otherwise be disposed to a landfill and transforming useful materials such as plastic, glass and paper into new products



turning items into raw materials (called (secondary materials) which can be used again usually for a completely new product – making a shoe from plastic bottles

**Basic topics for analysis:**

Presenting materials that can be recycled (recyclable) and new products that have been produced from secondary materials in our daily lives. How do we separate wastes (in our houses) and collect recyclable materials?

- **What About Source Separation?**

(<https://greenblue.org/reloop-what-is-source-separated-recycling/>)



- Single-stream versus source separation recycling
<https://recyclenation.com/2015/03/single-stream-versus-source-separation-recycling/>

Source Separation of recyclable waste into recycling bins (blue, green, yellow and red).

- Current practice in our house and school
- Current Municipal waste recycling programme in your municipality
- What are the recycling centers – or green points

Some benefits of recycling:

- reduces the amount of waste sent to landfills,
- conserves natural resources such as timber,
- prevents pollution by reducing the need to collect new raw materials,
- saves energy,
- supports manufacturing and conserves valuable resources,
- helps create jobs in the recycling and manufacturing industries
- supports further reuse of materials
- supports circular economy
- Extends life cycle of materials before going to landfill
- And more...

Material



The follow youtube link explains why recycling is important:

- <https://www.youtube.com/watch?v=7UuUeoyYmxI>

Kids can watch a video from a recycling factory in the following link:

- https://www.youtube.com/watch?v=0_Ufbm5ZkBY
- https://www.youtube.com/watch?v=6jQ7y_qQYUA

Session 5	Current practices and tips
Description	
<p>The presented current practices are the ones that Chios, Leira and Sarzana use to manage their waste at home and at school. In addition, tips are some basic methods that everyone (kids & adults) can apply to make the process more effective.</p>	
Material	
<ul style="list-style-type: none"> • https://www.reusethisbag.com/articles/top-23-best-recycling-tips/ • https://www.acamambiente.com/node/143 • http://lessismore.org/materials/30-reuse-tips/ • https://zerowastehome.com/tips/ • https://www.youtube.com/watch?v=HkHEJEzMKwc&t=383s • https://www.youtube.com/watch?v=ZQxJ1yyTI5Q&t=746s 	
Session 6	Single use plastics
Description	
<p>Definition of single use plastics. Many plastic products are purposely designed to be used only once. No matter the product, proper disposal is key to making sure no plastics end up where they shouldn't.</p>	

	<p>Can we identify which single use plastics should be banned? Can we give examples of single use plastics that cannot be banned?</p> <p>Discuss in the class.</p> <div data-bbox="539 376 922 654" style="text-align: center;">  </div> <p>The SUP Directive was initially proposed to tackle the single-use plastic items that are most frequently found in beaches, as well as in lost and abandoned fishing gear. Single-use plastic items are products made wholly or partially from plastic, and which are primarily conceived to be used only once (or a few times) before they are thrown away. Therefore, the definition also includes single-use paper items with plastic lining, such as cups and plates made of paper but with a plastic layer (also called plastic-coated paper).</p>
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The products' categories are divided as follows.

1) Products with alternatives readily available.

- cotton bud sticks
- cutlery (forks, knives, spoons, and chopsticks)
- beverage stirrers
- straws
- plates (including paper plates with plastic lining)
- sticks for balloons
- expanded polystyrene food containers, beverage containers and cups
- oxo-degradable plastics

2) Products with currently less widely available alternatives

- food containers
- cups for beverages (including their covers and lids)

3) Products already covered by existing EU legislation

- beverage containers with a capacity of up to three liters
- packets & wrappers
- food containers
- lightweight plastic carrier bags
- fishing gear

4) Other single-use plastic products

- balloons (EPR & awareness raising)
- tobacco products
- wet wipes (EPR, labelling & awareness raising)
- sanitary towels - pads, tampons and applicators (labelling & awareness raising)

Examples of single-use plastics that we use in our daily life. Presentations of drawbacks and groups who are involved in reducing single use plastics (eg presenting photographic material from actions by such groups).

Important points

- We can carry on our everyday life without some Single-use plastic products.
- Many “single-use” items can be reused, or recycled, which gives them a second life.
- Many medical items are specifically designed to be used only once to prevent cross contamination and infection.

Material

- https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf
- <https://www.onegreenplanet.org/environment/documentaries-will-make-rethink-single-use-plastics/>
- <https://www.youtube.com/watch?v= 6xlNyWPpB8>

Session 7	1st Activity → Monitor our waste at home & at school
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Description

- Weighting their home waste for a week separating organic and recyclable. Present the results at school.
- Recycle week at school in each class. At the end of the week you can make a comparison between classes and reward classes for their effort. Support from local waste management companies can be investigated.

Material

- Ideas from articles:
- <https://www.buzzfeed.com/mallorymcinnis/teachers-are-great>
 - <https://www.youtube.com/watch?v=RCxGczScfnI> (Actsmart Schools, Waste and recycling at your school)

Session 8	2nd Activity → Role Playing
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Description

Example for a classroom of 20 students:
1st step: Separate the students in 3 groups (Citizens, Municipality and Waste Management company)
2nd step: Give them a subject for discussion (eg. Citizens want an environmentally friendly municipality, municipality gives other priorities before environmental issues and the company explain the advantages and disadvantages of waste management)
3rd step: Process will take place for 15-20 minutes
4th step: Discuss the outcomes of this game

Discussion

Description

Evaluation questionnaire to compare the knowledge they gained with the knowledge they already had. *
 Discuss with kids what they learn after all sessions

4. Educational material (materials/sources/resources required to complete the course)

- ❖ Websites
- ❖ Course material

The reference material, the bibliographic review, the proposed supplementary literature and everything else concerning the educational material will be uploaded on the platform and will be available to the public.

4.1 Keywords

Pollution, Reduce, Reuse, Recycle, Single use plastics, Waste management, Waste prevention.

4.2 "Flow Chart of Teaching"

In order to evaluate teaching, trainers should take into account the relevance of the goals they have set with the available time dedicated for the completion of the lessons. They are called, in a limited time, to balance between the teaching objectives that the curriculum requires and the pupils' educational needs. In order to respond to this double obligation it is necessary to make a planning of the steps they intend to follow in teaching. In any case, the "Flow Chart of Teaching" is presented in the following table

Introduction → Waste management

Reduce → What is it and why is it so important?

Reuse → What is it and why is it so important?

Recycle → What is it and why is it so important?

Single use plastics → Why is it so important to reduce our use? Which are the effects on the environment?

Activities → Through the activities theory will be more understandable and practical and encouraging to an environmental friendly behavior

Discussion → Assessment of teaching

***Sample of questionnaire**

Gender:

Age:

- 1) Do you know what waste management is? Yes or No
- 2) Which of the following items are recyclable? (Choose more than 1)
 - Paper
 - Eggs
 - Straws
 - TV
 - Batteries
- 3) Do you usually separate your waste at home? Yes or No or Sometimes
- 4) Do you usually separate your waste at school? Yes or No or Sometimes
- 5) How important do you think this process is? Not at all or A little or Quite or Very much