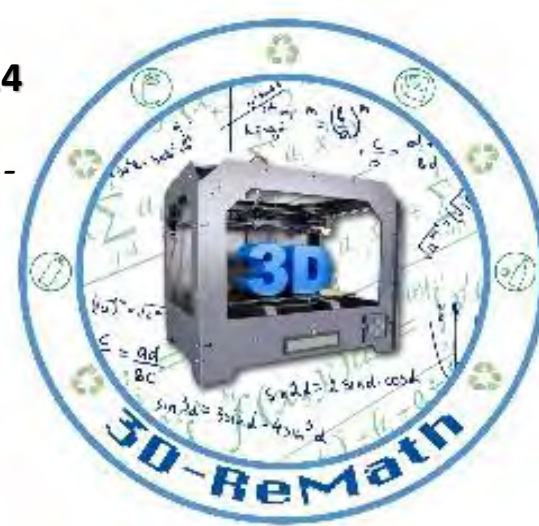




Project code:
2019-1-EL01-KA201-062914

Erasmus+ Call: 2019 - KA2 -



Erasmus+

This project is funded by the European Union.

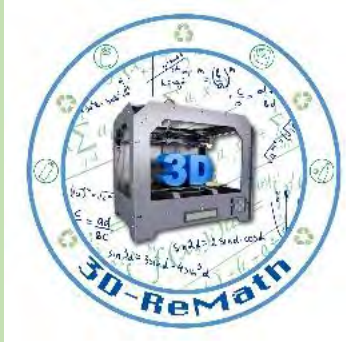


2nd
Primary School
of Chios



3D printing technology aims students understanding maths and recycling procedure

Intellectual Output 4 (IO4) - Curricula for Recycling



Part A: Waste Management and Recycling



**Waste Management
Laboratory**

**DEPARTMENT OF ENVIRONMENT
UNIVERSITY OF THE AEGEAN**



Erasmus+

This project is funded by the European Union.



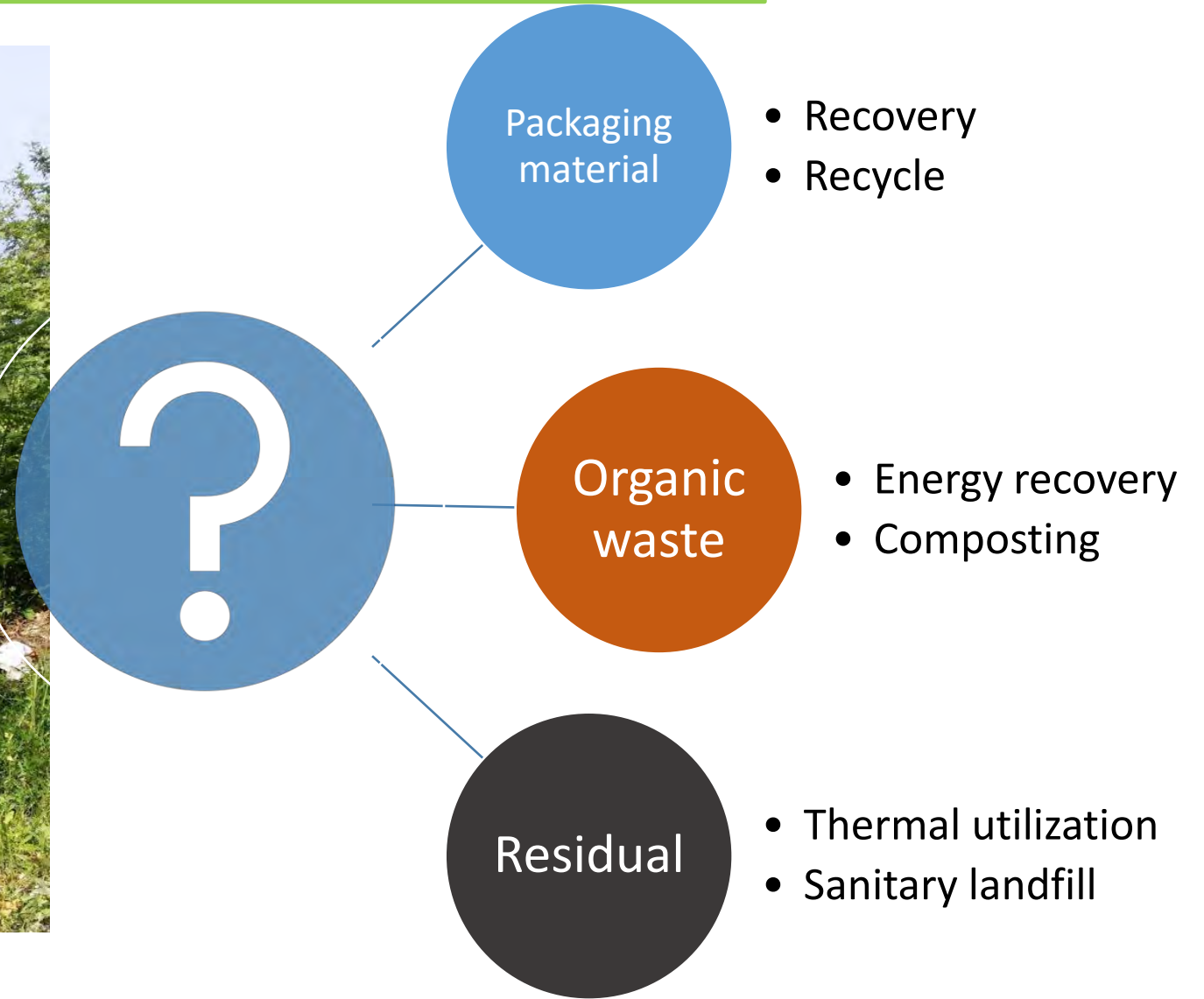
Presentation Structure

- a) What is the problem?
- b) Methods of waste management
- c) What is recycling?
- d) Why is it so important?
- e) Can we recycle all our waste?
- f) What must we do with our recyclable materials?
- g) What happen after the bin?
- h) Current practice in our house and school
- i) Municipal waste recycled

Is it all really litter?



What is found inside a bin?



Waste management practices

Landfill



Incineration



Material Recycling

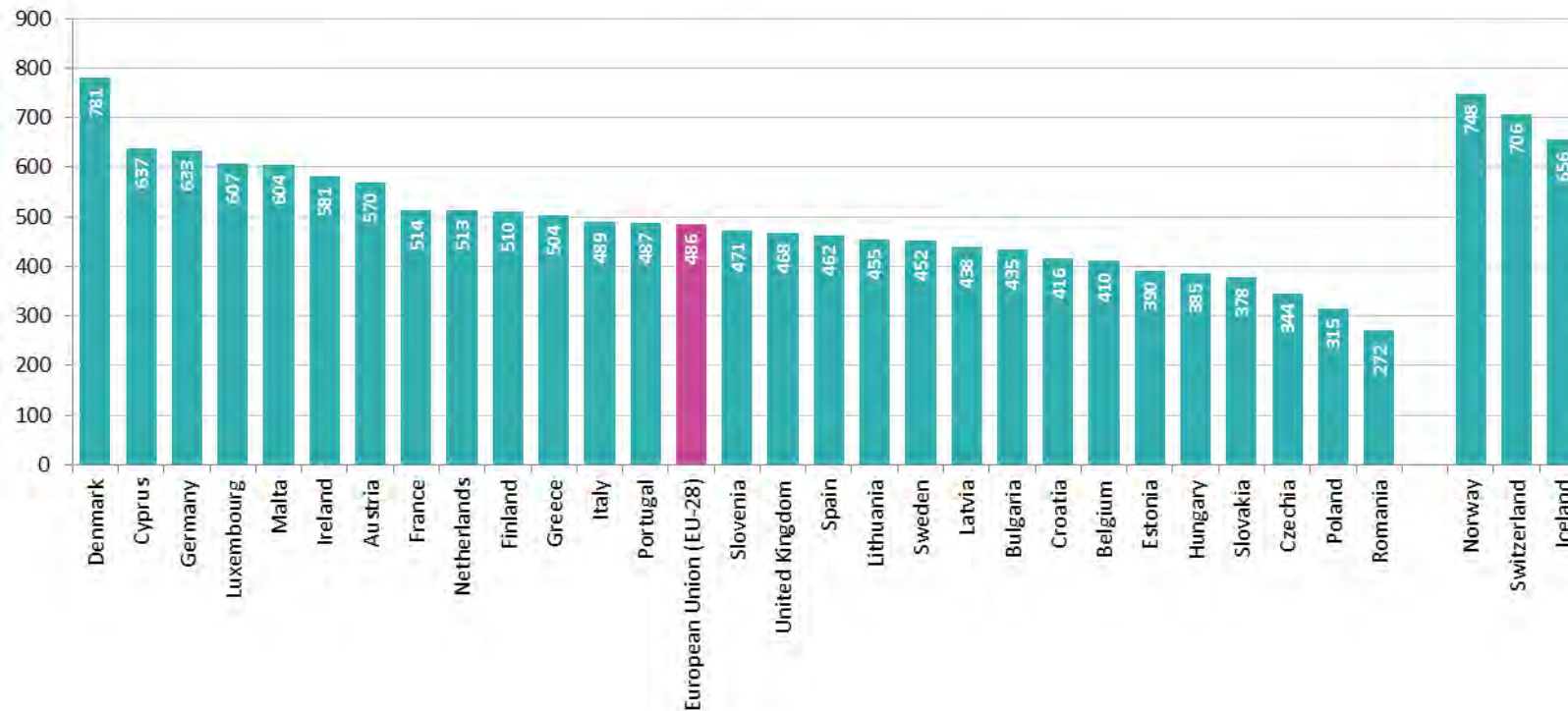


Composting



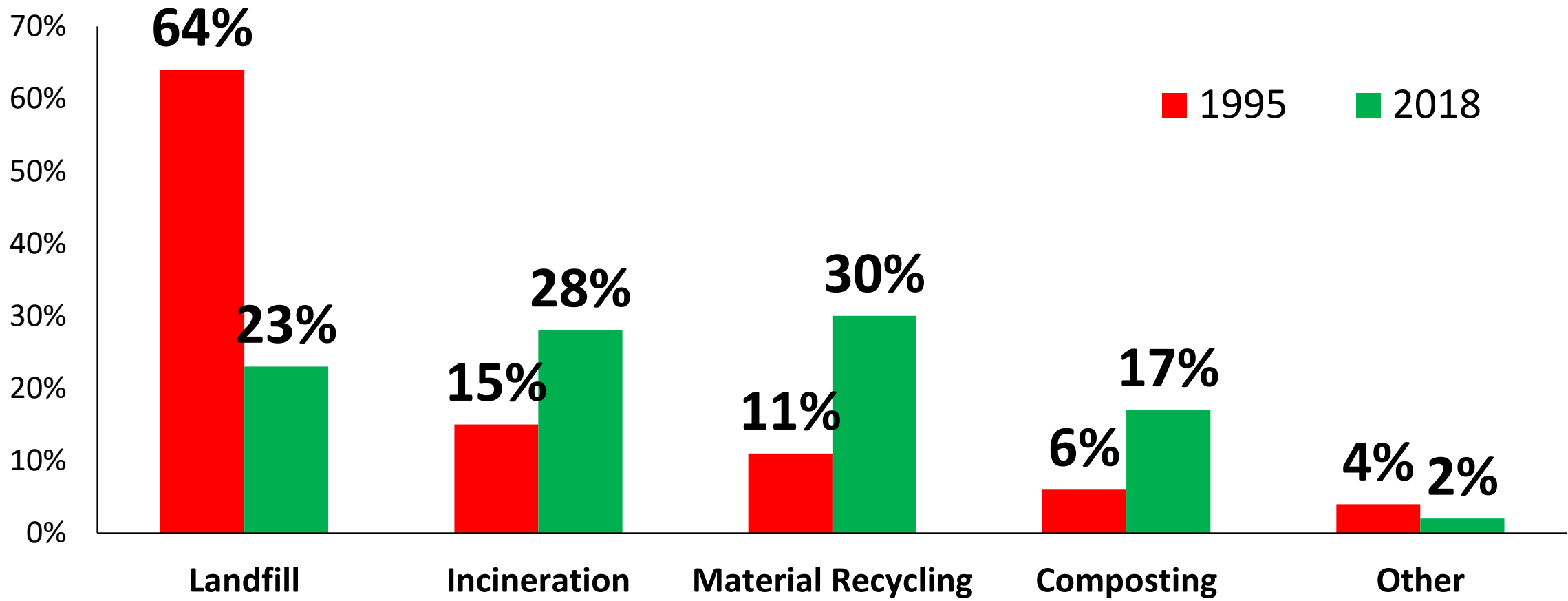
What is the problem?

Municipal waste generated, 2017
(kg per capita)



Germany, Spain, France, Cyprus, Luxembourg, Poland and the European Union: estimated data
Ireland: 2016 data
Source: Eurostat (online data code env_wasmun)

Comparison of waste management practices in the EU from 1995 to 2018



What can we do to reduce waste for landfills?



What is recycling?

- **Recycling of waste** is defined as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.



Why is it so important to recycle our waste?

Benefits of recycling

- **Landfills** - Recycling materials means less trash and saves space in dumps and landfills.
- **Resources** - When we reuse, we use less non-renewable resources, contributing to their preservation
- **Pollution** - In general, recycling materials can produce less pollution helping to keep our environment clean.
 - ✓ reduces the amount of waste sent to landfills
 - ✓ conserves natural resources such as timber, water and minerals
 - ✓ increases economic security by tapping a domestic source of materials
 - ✓ 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

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



Can we recycle all our waste?

The image features a white background with several abstract geometric elements. A large orange semi-circle is positioned on the right side, containing the text 'Recyclable Materials'. To its left is a solid blue circle. Further left are two vertical yellow dashed lines, a green square outline, and a green L-shaped line. In the bottom left, there are four yellow dashed lines arranged in a curved pattern. A yellow circle is partially visible in the top right corner.

Recyclable Materials



PAPER



ALUMINIUM



PLASTIC



CARDBOARD



TINPLATE



BATTERIES



GLASS



**HOUSEHOLD ELECTRICAL
EQUIPMENT**



Current practices in 3D
ReMath participating
countries

Greece

<https://www.herrco.gr/>

Συσκευασίες από **γυαλί**,
(μπουκάλια από χυμούς,
βαζάκια από σάλτσες,
αναψυκτικά, αλκοολούχα
ποτά, κρασί, τρόφιμα κ.ά.)



Συσκευασίες
από **αλουμίνιο**
(αναψυκτικά,
μπίρες κ.ά.)



Συσκευασίες από **χαρτί**
και **χαρτοκιβώτια**
(γάλα, χυμοί, δημητριακά,
πίτσα, μπισκότα, ζάχαρη,
απορρυπαντικά,
χαρτοσακούλες κ.ά.)



Συσκευασίες από
λευκοσίδηρο
(γάλα εβαπορέ,
κονσέρβες, τροφές
για κατοικίδια,
τοματοπολτό κ.ά.)



Συσκευασίες από **πλαστικό**
(μπουκάλια από νερό και
αναψυκτικά, γιαούρτι, βούτυρο,
λάδι, απορρυπαντικά, είδη
καθαρισμού, σαμπουάν,
αφρόλουτρα, φιλμ περιτυλίγμα-
τος, αποσμητικά, πλαστικές
σακούλες κ.ά.)



PER CHI VIVE IN CASA SINGOLA

ABITAZIONI COMPOSTE DA 1 A 5 UTENZE

UMIDO



il cestino forato da sottolavello e i sacchetti compostabili servono per raccogliere in casa la parte biodegradabile (organica). Una volta pieno, inserire il **sacchetto ben chiuso** nel **mastello marrone** ed esporlo per la raccolta nei **giorni e orari indicati nel calendario del porta a porta**.



CARTA

inserire i materiali sfusi nel **mastello bianco** ed esporlo nel **giorno e orario indicato nel calendario del porta a porta**.



IMBALLAGGI IN PLASTICA E METALLO

inserire i materiali nel **sacco giallo** ed esporlo nel **giorno e orario indicato nel calendario del porta a porta**.



SECCO NON RICICLABILE

inserire i materiali nel **sacco grigio** ed esporlo nel **giorno e orario indicato nel calendario del porta a porta**.



RACCOLTE DI TIPO STRADALE

inserire i materiali (vetro, tessili, olio) nelle **campane/contenitori stradali** dislocati sul territorio.

Portugal

LIXEIRA AMARELA: METAL



- Latas de bebidas e alimentos
- Ferragens, esquadrias
- Fios elétricos
- Arames e chaves
- Panelas e bandejas
- Descartáveis de alumínio
- Objetos de metal em geral (alumínio; cobre; aço)

Não pode ser reciclado: esponjas e palhas de aço, latas de aerossóis, latas de produtos tóxicos (tintas, inseticidas, pesticidas, etc), cliques e grampos.

LIXEIRA VERDE: VIDRO



- Garrafas
- Frascos e potes (alimentos, remédios, perfumes, etc)
- Recipientes (copos, jarras, etc)
- Fragmentos e cacos dos itens já citados

Não pode ser reciclado: Lâmpadas, espelhos, ampolas de medicamentos, vidros temperados, louças, vidros refratários, cerâmicas, porcelanas, lentes dos óculos, cristais, tubo de televisão e válvulas.

LIXEIRA VERMELHA: PLÁSTICO



- Embalagens em geral
- Garrafas PET (refrigerantes)
- Canos e tubos de PVC
- Sacos e sacolas
- Brinquedos quebrados
- Copos descartáveis
- Utensílios domésticos
- Isopor

Não pode ser reciclado: adesivos, placas de raio X, acrílico, espuma, embalagens plásticas metalizadas (salgadinhos e bolachas); embalagens plásticas misturadas com papel, papel filme e similares, cabos de panela.

























LIXEIRA AZUL: PAPEL



- Papel e papelão
- Jornais e revistas
- Impressos em geral
- Caixas de papelão
- Cartolinhas
- Envelopes e sacos de papel
- Cadernos e rascunhos
- Aparas

Não pode ser reciclado: Etiquetas e fitas adesivas, fotografias, papéis sanitários usados, bitucas de cigarro; papéis metalizados (de bolachas e salgadinhos), papéis plastificados, papéis encerados ou impermeáveis (fax, carbono etc), papel vegetal.

<http://www.gibiosfera.com.br/blog/tag/meio-ambiente/>

Plastic Codes								
CODE								
	PETE	HDPE	V	LDPE	PP	PS	OTHER	
PLASTIC TYPE	Polyethylene Terephthalate	High-Density Polyethylene	Vinyl	Low-Density Polyethylene	Polypropylene	Polystyrene	Other plastics	Biodegradable plastics
EXAMPLES	Water bottle, Soda bottle, Peanut butter container.	Milk container, Shampoo bottle, Motor oil bottle	Detergent container, Clear food packaging, Piping.	Plastic food wraps, Squeezable bottle.	Yogurt container, Ketchup bottle, Syrup bottle.	Disposable plate & cups, Meat trays.	Baby bottle, 5-gallon water container	Bio-based plastic bottles
								
RECYLABLE?								

Plastics are usually marked with an identification code that shows a recycling symbol and a number from 1 to 7. This indicates the type of chemicals, or polymer, used in making the plastic.

Facts About Recycling



What should we do with our recyclable materials?



GREECE, CHIOS



ITALY, SARZANA



PORTUGAL, LEIRIA



What is the fate of the collected materials?

This is Blippi and he will show you where our recyclable materials go after we throw them into the bins...

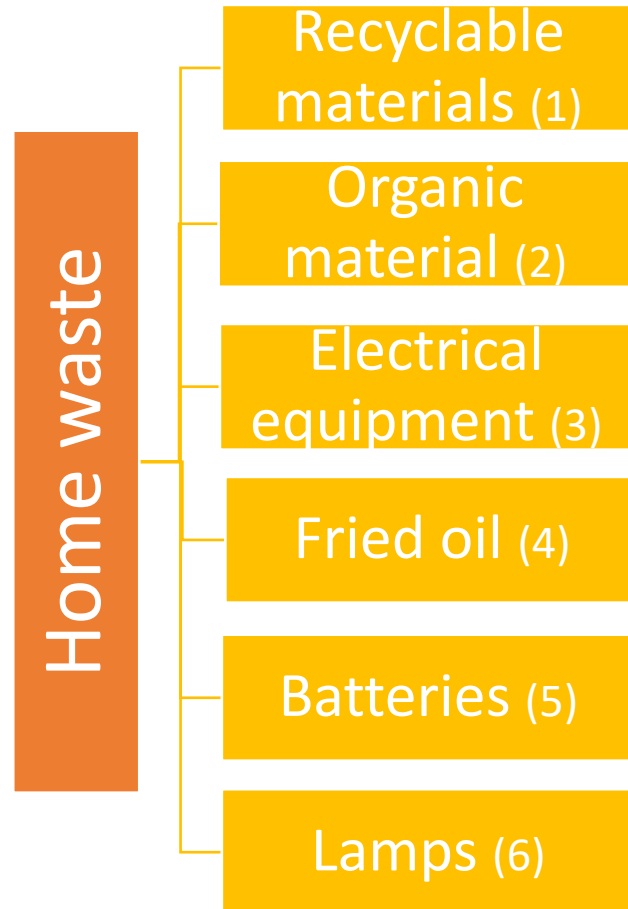


<https://www.youtube.com/watch?v=0xTyKc6LGdY>

<https://www.youtube.com/watch?v=5YaTpL8nl7c&list=PLhVnq7Mu3OUylzzO79d8FoaVSenSfi72G>

Different for each country

Current practice in our house (Chios municipality)



(1)



(2)



(3)



(4)

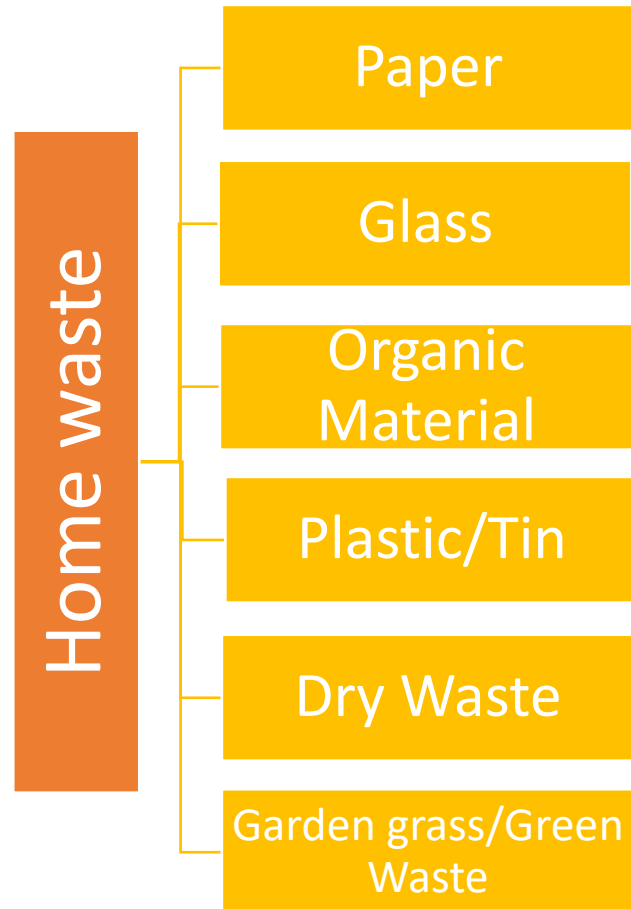


(5)

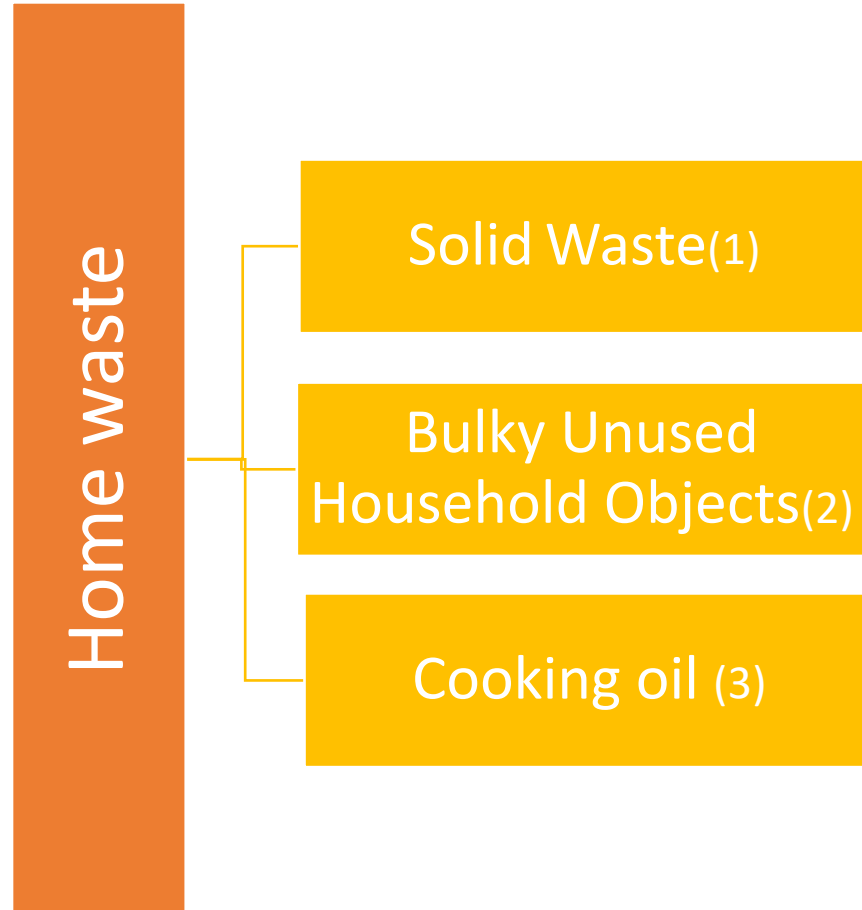


(6)

Current practice in our house (Sarzana municipality)



Current practice in our house (Leiria municipality)



(1)



(2)



(3)

TIPS for recycling at home

- Flatten cardboard boxes so that you can fit more recyclables into your bin
- All plastic bottles can be recycled
- It is not just newspapers that you can recycle at home. You can recycle wrapping paper, envelopes, birthday cards and phone books. All kinds of cardboard can be recycled, too, even toilet and paper towel tubes.
- Most metallic items in the house can be recycled
- Keep a space in your cupboard so that you can recycle as you are cooking or cleaning

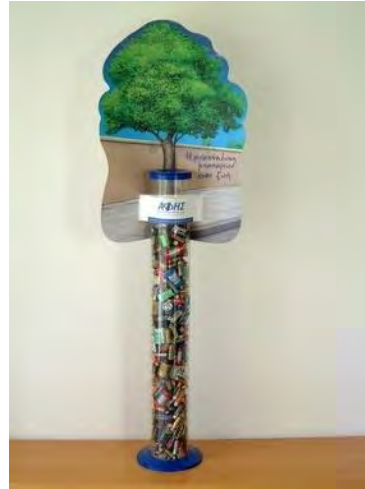
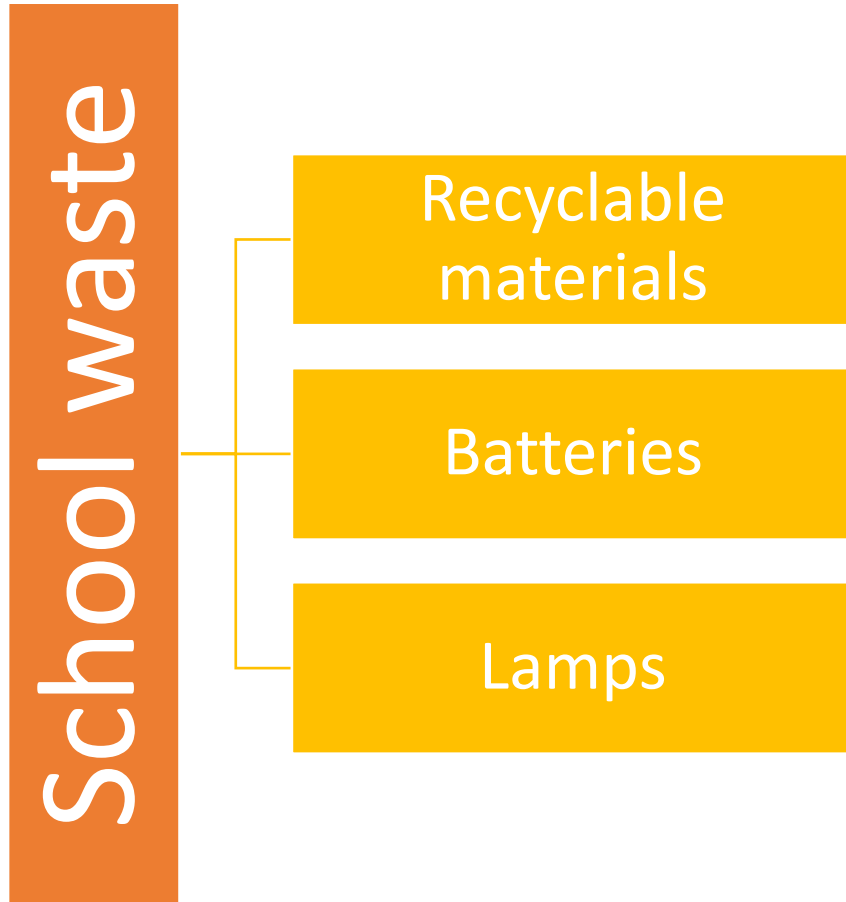


TIPS for recycling at home

- When going out, stop at your local recycling center and drop off anything that was not picked up by your curbside service.
- If you are ever unsure about what you can recycle, check with your refuse provider website.
- Glass can be recycled endlessly
- To help your recycling center and to keep down foul odors, make sure you rinse any plastic or glass with food waste



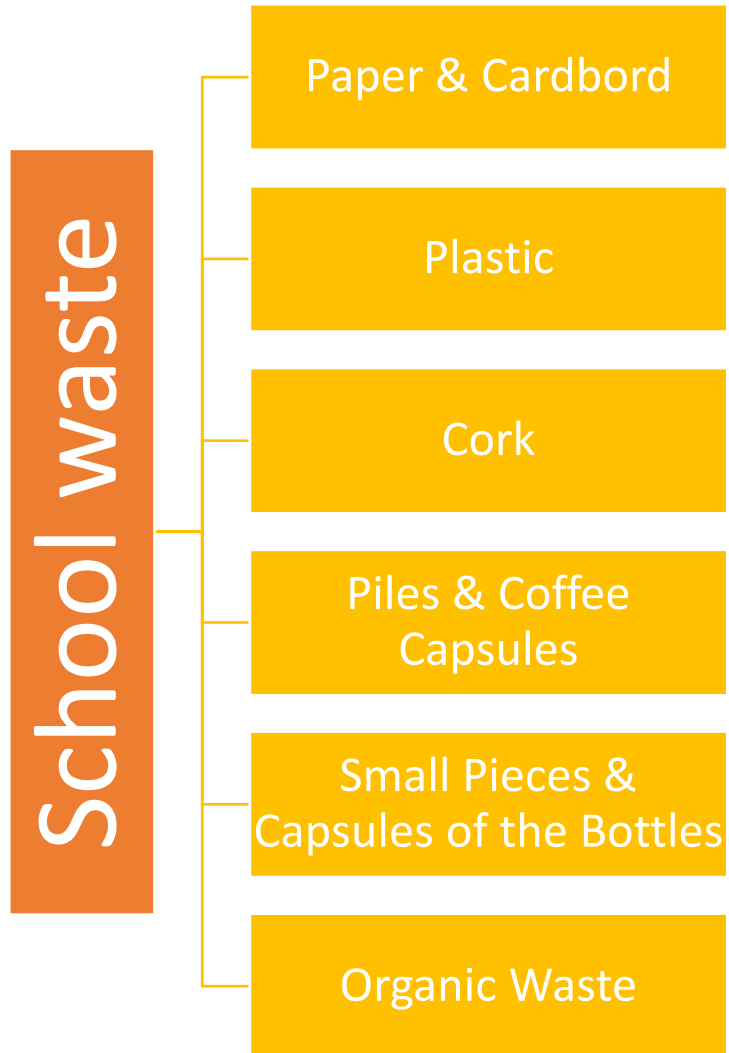
Current practice in our school (Greece-2nd primary school, Chios)



Current practice in our school (Italy-ISA13 Istituto Comprensivo, Sarzana)



Current practice in our school (Portugal-Agrupamento de Escolas de Marrazes, Leiria)



TIPS for recycling at school

- Every classroom, eating space and office should have plenty of bins available for recycling paper.
- If there are any school supplies left over at year's end, you can donate them to students in need or to a local organization that helps the needy.
- Begin a composting program in your school cafeteria to reduce the amount of food waste thrown away.
- Every cafeteria and eating space should have containers for plastic, paper and metal recycling.



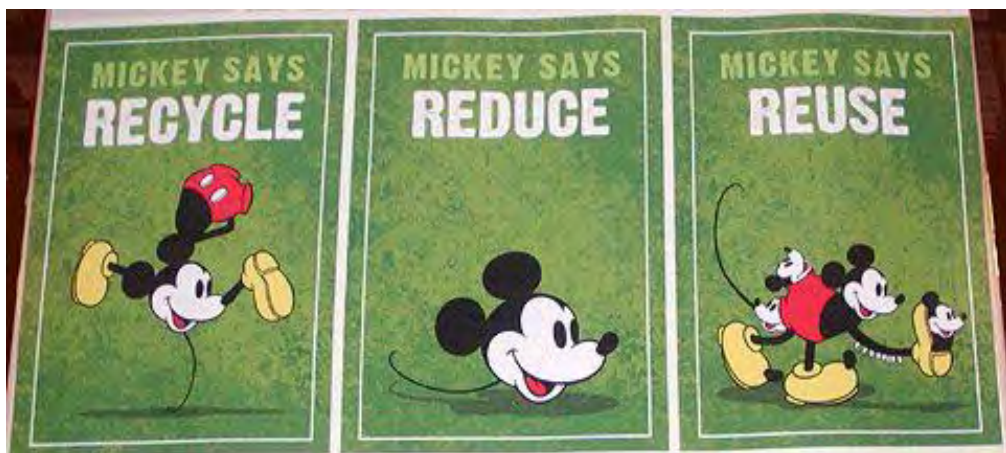
TIPS for recycling at school

- Common materials at school including aluminum, paper, cardboard and plastics are very easy for schools to compact into bales that can be hauled away by the recycling company.
- Every school administration should invest in effective recycling and waste management equipment, including automatic trash compactors
- Use [special fundraisers](#) for the school that promote recycling, such as selling [custom reusable bags](#).
- Think about making schools as paperless as possible.



Famous games and animation are supporting recycling!!!





Waste Removal & Recycling



THE AVERAGE FAMILY THROWS AWAY 6 TREES WORTH OF PAPER

IT TAKES THE SAME AMOUNT OF ENERGY TO MAKE ONE NEW CAN AS IT DOES TO MAKE 24 RECYCLED CANS



THE MOST COMMON TYPES OF WASTE



EVERY TON OF PAPER RECYCLED SAVES

- 7 TREES
- 9,000 POUNDS OF STEAM
- 275 POUNDS OF SULFUR
- 60,000 GALLONS OF WATER
- 350 POUNDS OF LIMESTONE
- 3.3 CUBIC YARDS OF LANDFILL SPACE



IF ALL OF OUR NEWSPAPERS WERE RECYCLED WE COULD SAVE ABOUT

250 MILLION TREES EACH YEAR

IN THE UNITED STATES, TRASH IS PRODUCED AT A RATE OF

1,609 LBS PER PERSON PER YEAR



THE ENERGY SAVED FROM RECYCLING ONE BOTTLE WILL POWER A 60 WATT LIGHT BULB FOR 6 HOURS

THE ALUMINUM AMERICANS THROW AWAY EACH YEAR IS ENOUGH TO PROVIDE THE AUTO INDUSTRY WITH ALL THE MATERIAL IT NEEDS TO BUILD A YEARS WORTH OF NEW CARS



STEEL CANS ARE RECYCLED IN JUST 6 WEEKS ALLUMINUM CANS IN ONLY ONE MONTH

THE AVERAGE HOUSEHOLD WASTES ENOUGH ENERGY WEEKLY TO POWER A TV FOR TWO YEARS



RECYCLING CREATES

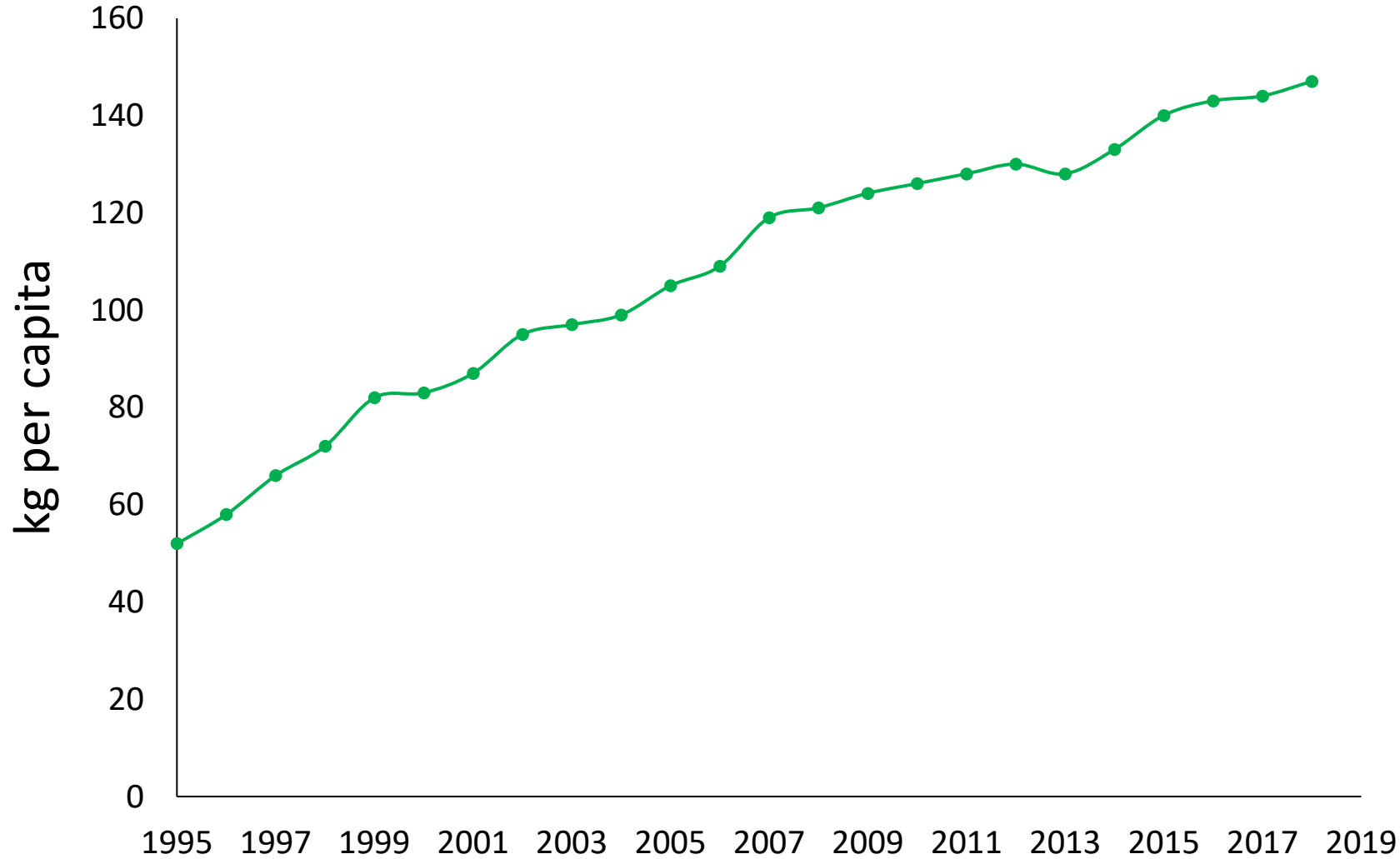
4 JOBS FOR EVERY **1 JOB** CREATED IN THE WASTE MANAGEMENT & DISPOSAL INDUSTRIES

RECYCLING CREATES 1 MILLION US JOBS

\$236 BILLION IN GROSS ANNUAL SALES & **\$37 BILLION** IN ANNUAL PAYROLLS

78 MILLION TONS OF WASTE MATERIAL DIVERTED AWAY FROM LANDFILLS IN 2005 AS A RESULT OF RECYCLING AND COMPOSTING.

Municipal waste recycled, EU-28, 1995-2018





Fun Facts About Recycling

Used paper can be recycled around **seven times**. After that the fibers get too short and are filtered out by the recycling process.

Fun Facts About Recycling

Glass is one of the best recyclable materials. Clear glass can be recycled infinitely, still it breaks - making it difficult to collect



Will you be a member of the super Hero Recycling Team?

INTRODUCING THE
BUSCH SYSTEMS

Super Hero Recycling Team



Captain KC

Big Blue

Mr. Recycle

Dr. Mobius

Citizen participation

- ✓ Enable
- ✓ Engage
- ✓ Encourage
- ✓ Exemplify



References

- [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Recycling of waste](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Recycling_of_waste)
- <https://hummingbirdinternational.net/infographic-recycling-by-the-numbers/>
- <https://www.youtube.com/watch?v=0xTyKc6LGdY>
- https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en
- <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190123-1>
- <https://www.reusethisbag.com/articles/top-23-best-recycling-tips/>
- <https://pianetabambini.it/raccolta-differenziata-schede-didattiche-scuola-primaria/>
- <http://recyclinginfographics.blogspot.com/2015/02/waste-removal-recycling.html>



Thank you for your time!