

BLOOM Stories

Title of your Story of (Online) Implementation

UNplasticize

Name of the author(s)

Honorata Pereira

Category

Please indicate with an "X" which prize category you wish to enter. Note that each category is judged according to specific criteria (to be found on the competition page and in Terms and Conditions). Only one category should be selected.

1. Teaching with bioeconomy in primary schools (individual work)	
2. Teaching with bioeconomy in secondary schools' STEM classes (individual work)	x
3. Integrated STEM teaching with bioeconomy – collaborative teaching (teams of two STEM teachers of different subjects)	
4. Integrated STEAM teaching with bioeconomy – collaborative teaching (teams of up to three teachers of different subjects, including at least one STEM teacher and at least one non-STEM teacher)	

The BLOOM resource used

Please indicate with an "X" which BLOOM School Box resource you implemented online or in your class.

Bloom your school with your biofuel and soap lab	
Examining the thermal properties of bio-based building materials	
Building a new environmental Future	X
Growing plastic and new life for plastic	X
How poop will change the world	
Don't waste your waste! - Raising Bioeconomy awareness	



Please indicate with an "X" which BLOOM School Box resource you implemented online or in your class.	
Yeast, biofuels and novel biotechnology techniques'	
Let's talk about bioenergy and our lives!	
The benefits of composting – How we can produce organic fertilizer in our school garden	
Biofuel production from fruit waste	
Back to the Future	

Abstract

Please briefly summarise your (online) implementation (maximum 200 words). Note that this summary will be used to disseminate your work, so it should be concise and appropriately reflecting the content. Make sure to add up to 5 keywords that you think best describe your (online) implementation.

About three-quarters of the marine litter in the world's seas is plastic. Research published in 2015 suggests that, in 2010, 4.8 to 12.7 million tonnes of plastic, or 2 to 5 % of plastic waste generated, entered the oceans [1]. With that in mind, this project aimed to make students aware of the amount of (micro) plastics present in essential goods of common use. Thus, the students investigated the microplastics present in personal hygiene products, in their clothes, in the washing waters of their clothes, and the ocean waters. They also assessed the amount of waste they produce at home, as well as the main waste from local industries. Finally, students were invited to present solutions to minimize the impact of waste and plastic on the environment.

Keywords: (Micro)plastics, Waste, Solutions, Environment

[1] Parker, L. "Eight Million Tons of Plastic Dumped in Ocean Every Year", National Geographic, 2015.
In: <https://www.nationalgeographic.com/news/2015/2/150212-ocean-debris-plastic-garbage-patches-science/>

The implementation context

Please briefly describe the context of your (online) implementation, specifying: what subject(s) you chose to implement the resource in, what are the students' ages, the size of the group, previous familiarity with bioeconomy activities, etc. (maximum 200 words).

Please note that the competition looks to collect stories of (online) classroom implementation, so the context must appropriately reflect this.

This project was implemented in the chemistry classes, in the material properties module, it was developed in a class of 20 students, aged between 15 and 16 years.

The students were unaware of the concept of bioeconomics, although they had participated, in the previous year, in an entrepreneurship workshop.

The purpose of the project was to contribute to students' awareness of changing values and attitudes for building sustainable societies, since the responsibility is individual, but the preservation of the planet needs to be collective.

Your story

What did you do? Please describe how you used the BLOOM School Box in your teaching. For example, what was the structure of the session(s); did you make any adaptations to the resource? *If you are entering the competition in categories 3 or 4 (collaborative teaching), describe how you worked together with your colleagues to carry out the lesson. (maximum 400 words).*

First, we started by using the "Building a new environmental Future" feature. Thus, students watched a short clip about bioeconomy (see video "[The Bioeconomy Starts here](#)", students receive different objects that they must categorize according to them being bio-based or non-bio-based.

In the **second** part, we used the resource "Growing plastic and new life for plastic": the students reviewed pictures about plastic pollution, and analysed the microplastics existing in their personal hygiene products, as well as in the washing waters of their clothes. A group of students investigated microplastics in sea waters, taking samples from three different locations, in the north, center, and south of the country. In this context, we analysed the amount of waste that each family produces, we visited the main industries in our locality - a dairy and an oil processing industry - to identify the main waste that each industry produces.

This way, students identified the problems associated with plastic, the garbage, and the waste we produce.

The **third** part of the project involved rethinking ways to recycle plastic and finding solutions to put the waste we produce in the value chain. In this way:

- (1) the students collected the High-density polyethylene (HDPE) plastic melted at low temperatures and moulded it to
- (2) With the residues of the cheese shops, whey, and with the oil; students created a line of sustainable cosmetics, with essential oils extracted from fruit peels.
- (3) With food residues, namely washing water from potatoes, eggshells, dried fruit skins, they produced biopolymers that they shaped in the form of Legos.
- (4) Still with the water for washing potatoes and rice, collected in the school cafeteria, and at the students' homes, they produced bioplastics and tested their biodegradability.
- (5) Currently, one of the students took the initiative to find a solution to recover the washing waters of parts of the automotive industry. So, with the recovered HDPE, he is building a model for an automotive industry and developing banana peel and eggshell filters to adsorb metal ions, such as Nickel and Chromium.

For the development of this project, we have the support of the School of Technology and Management of Oliveira do Hospital and BLC3 - Centre for Research and Technological Innovation.

Finally, students are preparing their projects to present at the Young Scientists and Researchers Competition, whose work will have to be delivered by June 5.

Learning outcomes

What did you achieve? Please describe the main learning outcomes you achieved with the (online) implementation of the selected School Box resource. Tell us about anything that supports your case for achieving these learning outcomes. For example, student comments, or any other evidence that illustrates the benefits and impact of your use of the School Box resource.

Note that you MUST have permission to include any photographs or screenshots especially parental permission in the case of young people. Any pictures you include should be added directly in the entry form.

The resources used in the "School Box" allowed us to meet conditions, develop strategies and select means to implement the project according to the needs of our locality. As such, the implementation of the project made it possible to promote responsible citizenship, involve the participation of decision-makers, and contribute to a more sustainable and environmentally conscious community. Considering that we cannot produce more waste, that we have to start making more "eco-friendly" choices", that individual attitudes affect everyone and that future jobs are related to the economy's ability to restructure itself around the requalification of the garbage we produce, minimizing energy and water waste.

See part of our work on [Padlet](#) (content in Portuguese) – You can see the full document with pictures in the [Annex](#).

Teaching outcomes

What did you, as a teacher (or a group of teachers) get out of teaching with the BLOOM School Box? What would you say to other people thinking about using bioeconomy in their teaching?

If you are entering the competition in categories 3 or 4 (collaborative teaching), please also describe your experience in collaborating with teachers of other subjects in your classroom. What is different from traditional teaching? (maximum 200 words).

The resources of the "School Box" as well as the work developed by the students have been, without a doubt, the subject of the moment in my videoconferences with the students. Because the concepts worked on them and it is interconnected to others subjects of high relevance such as climate change, food security, health, industrial restructuring, energy security, prevention policies (in the environmental spectrum), agriculture and livestock, rural cultures, education for biodiversity, value creation and work. All these themes are considered "the great challenges of 21st-century world politics". Thus, the features of the "School Box" offer a unique opportunity to comprehensively and interactively address interrelated social challenges, such as security, scarcity of natural resources, dependence on fossil resources, climate change, and sustainable economic growth. On the other hand, the activities promote students' involvement with their locality, with industry, research centers, government, and so on...

Just by taking them out of the classroom and allowing them to experience and solve community problems is an asset for their awareness and engagement with the challenges proposed.

About the BLOOM project

[BLOOM](#) is an EU Coordination and Support Action implemented from 2017 to 2020. The project aims at bringing together partners from across Europe to debate, communicate, and engage the public in the potential of bioeconomy. An economy based on biomass promises to foster a circular economy and to enhance climate change mitigation, while reducing dependence on fossil fuels. Bioeconomy covers a broad range of sectors, from agriculture and the agrifood industry, to fisheries, forestry, biorefineries, chemistry and (bio) energy – but despite its many applications, it has yet to enter into the public consciousness as an exciting solution to societal challenges.

Annex

See Padlet content in the following pages¹.

¹ Teacher has the authorisation from parents and guardians to share the images.

BLOOM - Bioeconomy

Clube de Ciência Viva da Eptoliva

HONORATA PEREIRA 30/04/20, 12:57 HS

Análise das águas de lavagens de roupa de algodão



pH2O

Apresentação do Logótipo



Medição do PH de água recolhida da praia



Colocação de fermento, para produção de microorganismos



Observação de microorganismos



Recolha de água e algas

Água recolhida para observação de microorganismos



Visita á queijaria



Processo de corte dos plásticos recolhidos



Criação de uma maquete feita com plástico reciclado

Seleccção dos plásticos;



Moagem da casca de banana

A casca da banana depois de bem seca foi ao robô de cozinha onde foi moída;



Secagem da casca de banana

Recolha da casca da banana;
Secagem da casca da banana;



Seleção do material biológico para os filtros eco sustentáveis

Seleção dos seguintes produtos:

Couve liofilizada;
Carvão activado;
Casca de banana moída;
Areia do rio;
Areia da praia;
Algodão;
Hidróxido da patita.

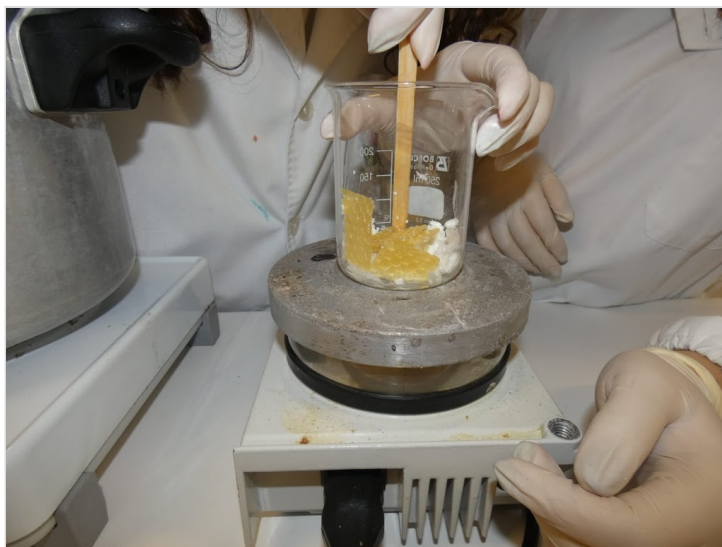
Limpeza ,desinfecção e esterilização do material.



Produção do Gloss de cor. Produção do Gloss de cor. utilizamos 10 ml de glicerina de frutos vermelhos, 5g de cera de abelha, 5g de

Balsamo labial

6g de manteiga de karite, 8g de óleo de coco, 4g de cera de abelha, 2 gotas de óleo de hortelã-menta.



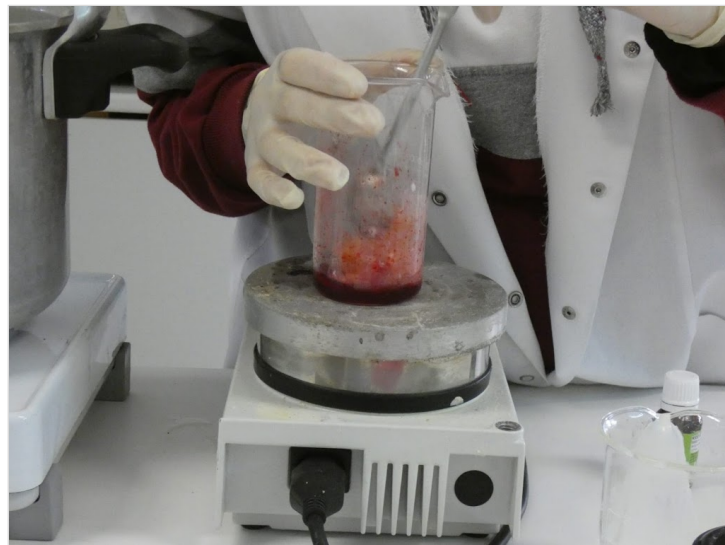
Óleo de limpeza para pele seca e madura

90 ml de óleo de alperce 10 ml de óleo de ricineo, 5 ml de vitamina E, 3 gotas de óleo de rosa musquete



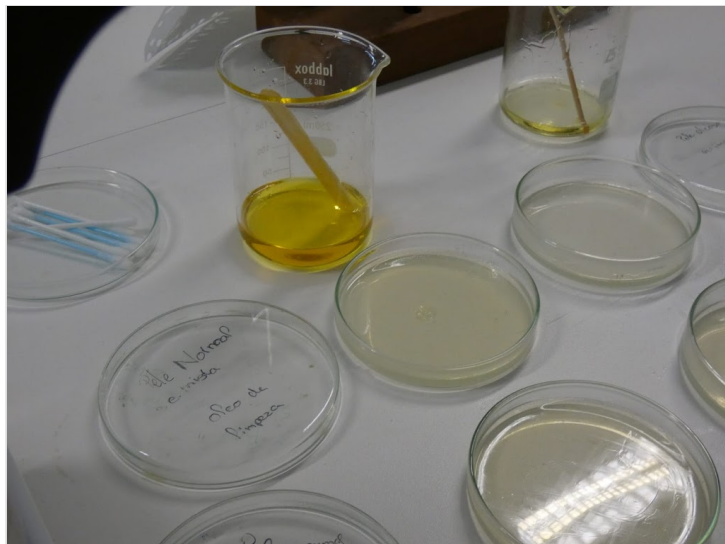
Produção do Gloss de cor.

utilizamos 10 ml de glicerina de frutos vermelhos, 5g de cera de abelha, 5g de manteiga de karite, 5g de óleo de coco, 2ml de óleo de ricínio, 1 colher de chá de corante natural .



Produção de pele sintética

Foi feito através do meio de cultura pelo método de difusão em H.



Extração do óleo da laranja

secando as cascas / desidratando e as cascas foram muidas a fim de facilitar o rompimento das células. Adicionamos água destilada de seguida colocamos num balão de destilação e procedemos à destilação simples da qual obtemos o óleo essencial da casca da laranja



Bio mec

Criação de filtros eco sustentáveis, para a filtragem das águas residuais da lavagem de peças em oficinas.

Águas essas que são libertadas no meio ambiente (solos e em águas fluviais) .



Plantas efervescentes

12 colheres de bicarbonato de sódio, 6 colheres de ácido cítrico, 6 colheres de amido vegetal, de 2 colheres de sopa de álcool, 10 gotas de óleo de laranja , 3 gotas de óleo de alecrim, 1 gota de óleo de lavanda.



Produção de Biopolímero

Reaproveitamento de desperdícios orgânicos e águas residuais á base de amido.



A journey on the solar system

Logótipo



Astronaut_1.mp4

2:59 vídeo

PADLET DRIVE

Projeto Funny4Kids

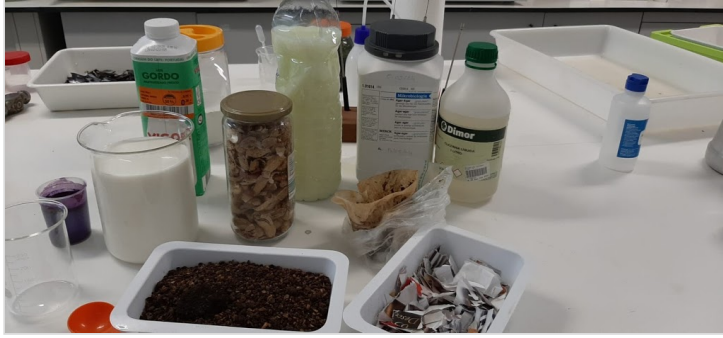
Logótipo Escolhido



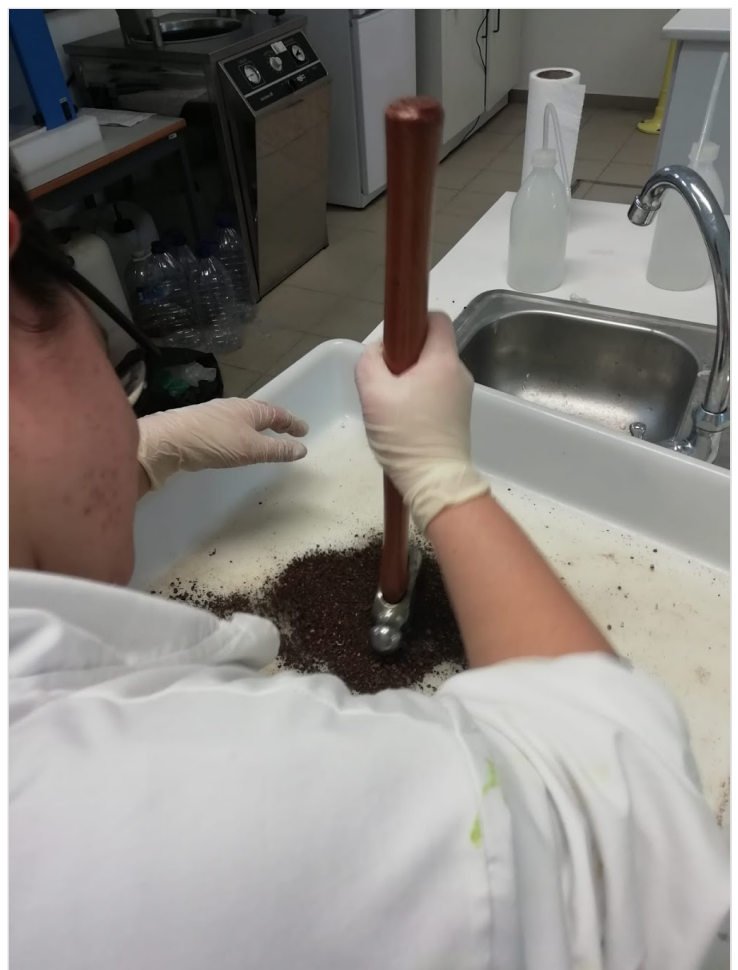
Ingredientes

Borra de café
Papel
Casca de Amendoim
Leite
soro de Leite
Sumo de beterraba
Agar-Agar

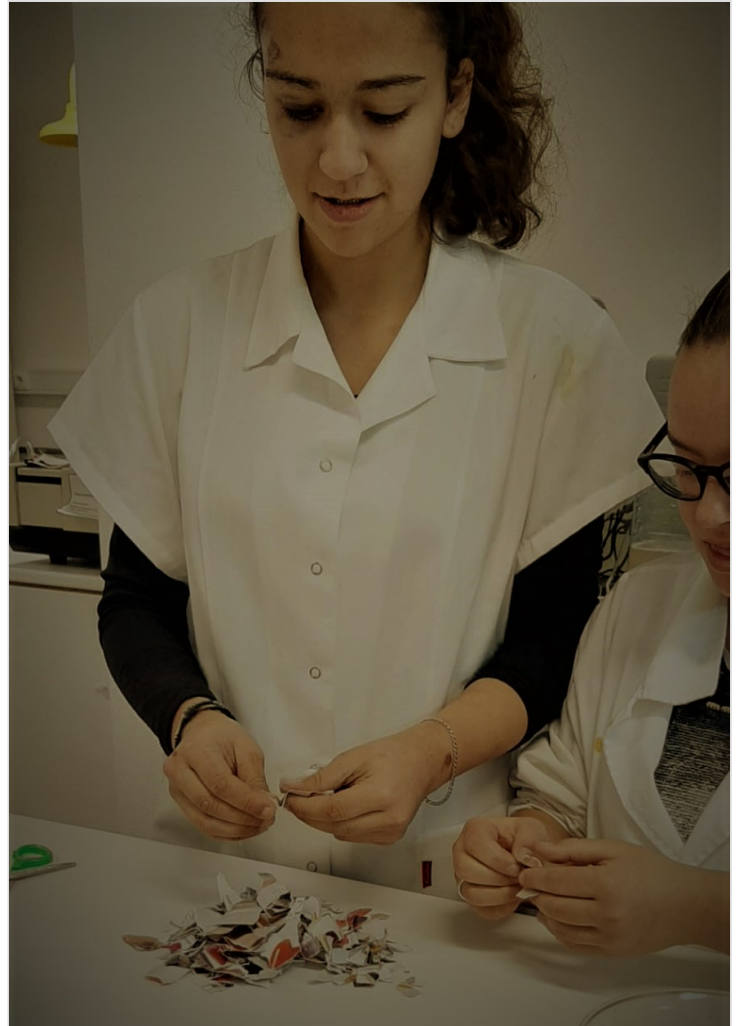
Glicerina
Caroços da Azeitona



Caroços da azeitona



Papel



Montagem de Produto



Produto Final