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GREEN-EDU Learning Activity

Title: Plastic Recycling and reuse

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Summary

Lesson plan summary

In this lesson plan students will be introduced to Green Chemistry principles and their importance for a sustainable future. They will also be introduced to the 3Rs (reduce, reuse, recycle).
A collection of everyday objects will be presented and students will be asked to investigate which of them can be recycled, in which color recycling bin they should be thrown away and also investigate the details of their recycling.
Furthermore, various orange juice packaging (glass bottles, plastic bottles and several kinds of paper cartons) will be provided and elementary school students will be asked to examine their components, check whether they can be recycled and investigate the respective recycling processes.

Subject	Green Chemistry
Topic	*Recycling and Reuse*
Age of students	*6-12*
Preparation time	*X min*
Teaching time	*X min*
Online teaching material (links for online material)	*Introducing Green Chemistry: The Science of Solutions* *https://blossoms.mit.edu/videos/lessons/introducing_green_chemistry_science_solutions* *Reduce-Reuse-Recycle* *https://www.youtube.com/watch?v=Q0Nq4b_07Fc&t=25s*
Offline teaching material	*https://www.beyondbenign.org/bbdocs/pdfs/Lactic_Acid_Titration_Extension.pdf* • *"12 Principles of Green Chemistry" from Figure 4.1: (p.30). 12 Principles of Green Chemistry from Green Chemistry: Theory and*

	Practice (1998) by Anastas P and Warner J. By Permission of Oxford University Press. • *American Chemical Society Green Chemistry Institute* • *EPA Green Chemistry* • *Beyond Benign* ▪ *https://www.conserve-energy-future.com/reduce-reuse-recycle.php* ▪ *https://www.sustainablesanantonio.com/practices-technology/reduce-reuse-recycle/* ▪ *https://www.youtube.com/watch?v=OasbYWF4_S8&t=11s*

Aim of the lesson

Students are asked to determine which kind of bags are the most environmental friendly, performing experiments as well as studying the theoretical principles to conclude based upon scientific study. They also get to know biodegradable plastics and their applications

By the end of this lesson students will:

1) Understand what green Chemistry is
2) Understand today's environmental challenges
3) Learn about the 3Rs
4) Practice recycling

Trends

Problem Based learning, Collaborative Learning

Activities

Name of activity	Procedure	Time
Environmental Challenges	Start with an introductory video and a discussion about environmental challenges our world faces today (https://www.youtube.com/watch?v=V0lQ3ljjl40)	15 min
Introduction to Green Chemistry	1. Start the lesson with introductory questions: What does a chemist do? What are some chemical products? What do you think about when you hear the words "Green Chemistry"? What is environmental science? 2. Students can watch the introductory video https://www.youtube.com/watch?v=rIE4T2HLW7c 3. Students will be introduced to the 12 Principles of Green Chemistry. Activity: Think about what Green Chemistry means to you. Present the 12 principles in your own words. Students will be divided in groups. Each group will be assigned with a green Chemistry principle and will be asked to present it with a skit, a drawing or even a song to their classmates.	30 min

The 3 Rs – Reduce –Reuse Recycle	Students are introduced to the 3Rs. They are asked to make a poster presenting the 3Rs	45 min
Real life recycling in class	1. A collection of everyday objects will be presented and students will be asked to investigate which of them can be recycled, in which color recycling bin they should be thrown away and also investigate the details of their recycling. 2. Various orange juice packaging (glass bottles, plastic bottles and several kinds of paper cartons) will be provided and elementary school students will be asked to examine their components, check whether they can be recycled and investigate the respective recycling processes.	45 min
Imagining the future: Design the future bag. 6	Students are asked to imagine the future of plastic use and other ways they could help the environment, using the Green chemistry principles	45 min