(ENG) Hazardous waste is everywhere, even in our houses

Introduction

#Online activity #Gamified learning #Teamwork #In-class activity #Experiential learning #Artwork

This activity will remind pupils of the importance of waste separation.

It will focus mainly on hazardous waste. It will also teach pupils how to act in a laboratory, how to safely use and store chemical equipment. Pupils will learn about hazard symbols and connect those symbols with products we use in our everyday lives. Pupils will be encouraged to take action and encourage their families to rethink their ways of dealing with different types of waste.

Learning Objectives

- [ ] Differentiate hazard symbols from one another.
- [ ] Categorise different types of waste.
- [ ] Plan a family event.

ACTIVITY DETAILS

Activity Details

Connection of the activity with Art

Painting

Link to local, national School Curriculum

General & Safety/Laboratory equipment safety

Equipment required

Duration of activity

45 minutes

Sources

Vrtačnik, M, Senta Wissiak Grm, K, Glažar S. A., Godec, A. (2019). MOJA PRVA KEMIJA, Izdaja 2019, učbenik za kemijo v 8. in 9. razredu osnovne šole.

Benedetič, A. (2013). "Kansky, Ana". Primorski slovenski biografski leksikon. Slovenska biografija. Retrieved from: Kansky, Ana (1895–1962) - Slovenska biografija (slovenska-biografija.si)

Photo credit:
Photo 1
Henrika Šantel (1874–1940)
The Chemist, 1932
oil on canvas
Courtesy of Gorški muzej, Slovenia
Source: Goriški muzej, Slovenia

Photo 2
Source: own
Pictograms retrieved from: GHS hazard symbols - Wikimedia Commons

Step 1 - Motivational Stage

1

Task 1

Show the illustration below to your pupils:

Henrika Šantel, The Chemist, 1932, oil on canvas, Courtesy of Goriški Muzej, Slovenia

Explain to your pupils:

In front of you is a portrait painting of Ana Kansky, a Slovenian chemist. She was the first person ever to gain a doctorate title from the University of Ljubljana, Slovenia, which was founded in 1919. She is also known in Slovenia as one of the first women scientists. Her main study was in the field of chemistry. After study, she, along with her husband, opened a chemical factory, where, among others, they produced a lot of pharmaceutical products. She and her husband also owned a chemical store.

Ask the pupils:

"What type of chemical equipment is she using in the portrait? Name the chemical procedure she is doing in the portrait."

- **Answer: separation**

Ask the pupils further:

"Is separation something we do in our everyday lives?

What type of separation are we required to do in our houses?"

Continue after somebody remembers that we are separating waste.

"How do we separate waste?

What type of waste can you name?

Have you ever heard the term "hazardous waste"?

What type of waste is hazardous?"

2

Task 2

Ask pupils to look at their homes and find a product they believe is hazardous.

Pupils should consider why this particular product is considered hazardous.

Step 2 - Investigational Stage

STUDENTS' TASKS

1

Task 1

Ask your pupils:

"Look at the painting "The Chemist" one more time. Do you think she is working with hazardous chemicals? Why (not)?"

"Name some equipment the woman in the painting is missing to safely work in the laboratory."

- **Answer: mask, gloves, she should have her hair tied back)**

Explanation

Besides all those things, it is important to follow some safety rules in the laboratory:

- [ ] Do not bring food and drinks into the laboratory space,
- [ ] Always wear closed shoes,
- [ ] Always follow the rules for safe laboratory work,
- [ ] Store chemicals in special strong and airy closets to avoid spills, unwanted interactions and vapour accumulation.

- [ ] Keep volatile substances away from non-volatile ones, and acidic substances from the basics.

2

Task 2

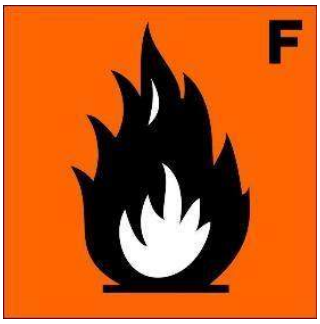
Show your pupils the following:

PHYSICAL HAZARDS PICTOGRAMS

EXPLOSIVE

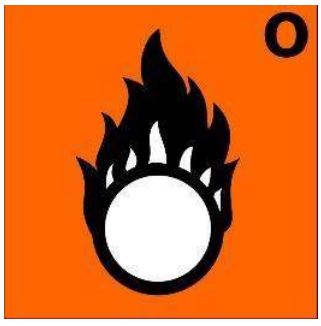
EXPLOSIVE

FLAMMABLE



FLAMMABLE

OXIDISING



OXIDISING

CORROSIVE (to metal)

CORROSIVE (to metal)

COMPRESSED GAS

HEALTH HAZARDS PICTOGRAMS

TOXIC

TOXIC

HARMFUL

HARMFUL

HEALTH HAZARD

CORROSIVE (skin corrosion)

CORROSIVE (skin corrosion)

ENVIRONMENTAL HAZARDS PICTOGRAMS

ENVIRONMENTAL HAZARDS

ENVIRONMENTAL HAZARDS

Task 3

Ask pupils to describe one by one what they see on a symbol and read what the symbol stands for. Every pupil should make at least one description, and every symbol should be described at least twice.

Ask your pupils:

"Why do you think there are two types of symbols?"

You additionally explain:

The signs with an orange background are the old signs. We can still find them in some containers but mainly there are symbols with red borders. The reason is that from 2009 the system the entire European Union uses for labelling the containers is called GHS (Globally Harmonised System). Beside these symbols, there are also so-called H and P sentences.

H stands for HAZARD

P stands for PRECAUTIONARY

So – every product that contains hazardous chemicals has to be marked with a proper symbol and it contains a sentence, H or P, depending on what type of hazard the specific chemical represents.

Those signs are very helpful because they tell us what we shouldn't or should do with certain products. If we obtain the rules and consider these signs, we are assured that we safely use these kinds of products.

Task 4

Ask your pupils:

"What would you wear, if you were working in a laboratory?"

"What would you wear if a product you're working with has a sign "corrosive"?"

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Task 5

Ask your pupils to take a quiz:

Note: You share the screen with pupils. Pupils are playing on their devices after inserting the generated PIN code the program provides. On your screen, there will be questions displayed, and pupils will answer by choosing options on their devices

QUIZ

Step 3 - Consolidation Stage

Ask the pupils:

"Why do you think waste separation is important?

Why do you think we have to separate specifically hazardous waste?"

Ask pupils to look at the internet for places that are the nearest to their homes and are collecting hazardous waste.

Create micro-groups of 2 pupils. They work in pairs and help each other to make a plan, how will they organise a family event. The event's aim is to collect all hazardous waste in their houses and take them to a dedicated place.

You can give pupils some directions: There are different types of hazardous waste. Think of used cooking oil, old batteries, and broken electronic devices. There are different ways and also points for collecting different types of hazardous waste.

Try to inspire pupils to take action beyond the proposed activity:

Firstly, they should talk to their parents about hazardous waste. Parents will share their knowledge and pupils will share what they've learned about waste in school. After the conversation, they should join forces and search the house for possible hazardous waste. They should gather the waste and take it to the proper place with their parents.

Ask pupils to write a report on their action.

End of the activity

EXIT