A dark, atmospheric painting of a bread-making scene in a rustic kitchen. A person is seen working at a table, surrounded by various kitchen items and bread. The scene is dimly lit, with a warm, golden light emanating from a source on the right, creating a sense of intimacy and focus on the craft.

(ENG) There is no bread for breakfast. What should we do?

Introduction

Step 1 - Motivational Stage

Step 2 - Investigational Stage

Step 3 - Consolidation Stage

Introduction



#Online activity #In-class activity #Experiential learning
#Teamwork #Artwork #Paintings #Theatre

We can observe chemical reactions or products all around us.

This activity will help pupils understand the role of chemistry beyond school lessons. With the observation of artwork, they will also learn about the history of chemistry. They will draw from life experiences to connect phenomena they are already familiar with in chemistry. They will also connect familiar professions with chemistry.

Learning Objectives

- ☐ Recall the knowledge of chemical phenomena.
- ☐ Differentiate several professions that are using chemistry in their work.
- ☐ Interpret chemical phenomena on an everyday event.

ACTIVITY DETAILS

Activity Details

Connection of the activity with Art

Painting, acting



Link to local, national School Curriculum —

General & Safety/ Role of chemistry in everyday life



Equipment required —

- Yeast,
- flour,
- water,
- salt,
- oil or baking paper.



Duration of activity —

45 minutes



Sources

Sajovic I., Wissiak Grm K., Godec A., Kralj B., Smerdu A., Vertsačnik M., Glasžar S. (s. a.), Kemija 8, i-učbenik za kemijo v osmem razredu osnovne šole. Retrieved from: <https://eucbeniki.sio.si/kemija8/index.html>

Kornhauser A., Frazer M. (2003), 8 pogled v kemijo, Učbenik za osmi razred osnovne šole.

The National Gallery, London, Great Britain, Retrieved from:

<https://www.nationalgallery.org.uk/paintings/adriaen-van-ostade-an-chemist>

Photo credit:

Photo 1

Adriaen van Ostade, 1610–1685

An Alchemist, 1661

oil on oak

34 × 45,2 cm

Public domain:

The National Gallery, London, Great Britain, Main Collection

<https://www.nationalgallery.org.uk/paintings/adriaen-van-ostade-an-chemist>

Step 1 - Motivational Stage



Ask pupils:



"You are out of bread but you have all necessary ingredients to bake one at home. Write a precise recipe with ingredients and process."

If the pupils don't know the recipe, they can either ask parents to help them or find a relevant recipe with the help of the internet. When they finish their task, ask them:



“What does making bread have to do with chemistry?”

Step 2 - Investigational Stage



STUDENTS' TASKS

1

Task 1

Show pupils the painting below:



Adriaen van Ostade, An Alchemist, 1661, oil on oak, The National Gallery, London, Great Britain, Main Collection

Ask them:



"Describe what the man in the painting is doing."



"Would his doing be in any way useful for you when making bread?"

Explanation

The man in the centre of this picture is using a pair of bellows to stoke the flames of a fire. He won't make bread, though for baking the bread the fire could be useful. The man in the painting is actually an alchemist. Alchemists were very active in the mediaeval ages, though the procedures of alchemy date back to ancient Egypt.

Alchemy is not chemistry. Chemistry is science, based on scientific evidence, while alchemy was an experimental activity and philosophy in a search for the philosopher's stone and elixir of life. The stone would transform any metal to gold, the elixir of life would grant immortality and eternal youth.

Alchemists were very driven to discover a greater or higher spiritual level and wisdom. In their research, they however developed a series of procedures and techniques that are still used in laboratories today. Alchemy was eventually cleared out by new sciences, such as chemistry, which was established in the second half of 18th century by a man called Antoine Laurent Lavoisier.

This painting was painted in 1661 in the time when alchemy was still pretty much alive. The painting depicts a man, who became obsessed with some alchemy procedures and is subsequently neglecting all of his surroundings, including his family, which is symbolically painted in the back corner almost unnoticeable.

Task 2

Ask the pupils:



"Look at the internet and find out what Antoine Lavoiser discovered to set the basis for modern chemistry."

Explanation

Nowadays chemistry is an acclaimed science and persons working in the field of chemistry are scientists.

We can see chemistry surrounding us every day. Buildings, for example, are built with chemical products, such as lime, brick, cement, plastic, glass, and alloys.

In medicine, there are several chemical procedures to develop medicines, which are often extracted from plants. Chemical procedures also enable disease detection and efficient treatment.

In our everyday life, we use chemical products to clean ourselves and our surroundings, and we dress in chemically derived materials.


Without knowledge of chemical procedures, we wouldn't be able to travel in a way and as fast as we travel nowadays.

Task 3

Explain: Beside chemists, there are a lot of professions which are using chemical knowledge in their work.

In this task students will be working in a team of two. Each team will be assigned with a profession that uses chemistry for their work. One member of the team is an interviewer and one of the team members is working in a given profession. Your task is to make a written interview in a way that it is very clear:

- which profession are you talking about,
- why is chemistry important for that profession,
- what kind of chemistry knowledge is mandatory to work in this profession,
- concrete examples of the work that are connected to chemistry and/or chemical procedures.

 You can use the internet for help.

After 10 minutes, you will be joined in a class and will act out the interview. Each team only shares answers about what kind of chemistry is important and what is used, and the others are trying to guess what the profession is.

Suggestions of professions: hairdresser, cleaner, painter, construction worker, farmer, beautician, ecologist, pharmacist, forensics, firemen, cook, confectioner, winemaker, archaeologist, geologist, vet.

Step 3 - Consolidation Stage



Ask the pupils:



“Do you understand now why chemistry is surrounding us everywhere? Name some examples of using chemistry at home.”

Ask pupils to take action beyond the proposed activity:



“Ask your parents to help you bake the bread following the receipt you wrote down at the beginning of the lesson. Observe all chemical changes happening in the whole process and write down their description.”

End of the activity

EXIT