

Chemistry ... What a Pizza!!!

Teacher Guide

Objectives

Competencies

- To use the inquiry scientific method to study a phenomenon;
- To encourage learning motivation through teamwork;
- "Learn to learn" for a meaningful learning;
- To argue in public about various topics.

Objectives

- To learn the concept of chemical transformation;
- To identify the transformation in a complex phenomenon;
- To identify the parameters that influence the transformation;
- To carry out simple qualitative and quantitative laboratory tests.

Contents

Chemical transformations, reaction rate and factors affecting reaction rate.

Organization of work

Stage 1

Give each student the task to carry out a research and to draw a concept map on the ingredients and the production process of pizza.

Stage 2 (1 hour)

The research results are discussed in class and a final map of the ingredients and the procedure is developed.

Stage 3 (1 hour)

The students are divided into groups of 4-5 elements and the following questions are asked:

- What chemical reaction takes place during the leavening?
- What are the reagents and products of this reaction? Can you identify them?
- What is the function of the leaven?
- Changing the amount of the reagents, which results could be achieved?
- Changing working conditions (time, temperature ...), which results could be achieved?

Professional Reflection-Oriented Focus on Inquiry-based Learning and Education through Science

The students, working in accordance with specific roles in the group, are invited to find answers by discussing among themselves, performing a web search or interviewing pizza maker or consulting texts. After the debate in the classroom, each group of students is asked to plan an experiment to confirm the results of the discussion.

Stage 4: in the laboratory (1 hour)

The assumptions made are verified by highlighting the reaction products of fermentation

1. detection of CO_2 through testing with barite water ($\text{Ba}(\text{OH})_2$)
2. detection of alcohol by testing with potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$)

Stage 5: in the laboratory (1 hour)

The assumptions made are verified by carrying out experiments on different ways of reaction

- a. changing the time for the leavening;
- b. changing the% of sugar;
- c. changing the amount of leaven;
- d. changing the amount of flour;
- e. changing the temperature.

Stage 6: summarize (1-2 hours)

Each group presents the obtained results and a list of questions to ask an expert is written.

Stage 7: in the kitchen (1 morning – educational trip)

The classes involved in the project go to a Hotel management school to prepare pizza with the help of an expert. During the preparation, each group presents the obtained results and questions are asked to the expert of culinary technique in order to compare the outcomes with the everyday practice.

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