



## Science in the kitchen

### SEQUENCE 1

Age group	6-9 y.o.
Prior knowledge	None
Material needed	3 Clear glass cups 2 Teaspoons sugar Dry yeast Water (warm and cold) 3 Small dishes Permanent marker
Subjects	Science, Biotechnology
Skills involved	<ul style="list-style-type: none"><li>• Distinguish similarities and differences in yeast fermentation.</li><li>• Demonstrate how yeast releases CO<sub>2</sub>.</li><li>• Students carry out experiments with yeast.</li></ul>
Time to carry out the sequence	1h 30 hour

#### Step 1: Introduction

Ask students if they have any idea about what yeast is used for?

#### Step 2: Storytelling

Read the story to the students. Ask students if Sofronia was a witch? Yeast was magic or real? Propose students to create a POP-UP CAKE CARD.



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## Step 3. Initial concepts

Yeast is most commonly used in the kitchen to make dough rise. Have you ever watched pizza crust or a loaf of bread swell in the oven? Yeast makes the dough expand. But what is yeast exactly and how does it work? Yeast strains are actually made up of living microorganisms/microbes, meaning that they contain cells with nuclei. Being classified as fungi (the same kingdom as mushrooms), yeast is more closely related to you than plants! In this experiment, we will be watching yeast come to life as it breaks down sugar, also known as sucrose, through a process called fermentation. Let's explore how this happens and why!

## Step 4: Discovering the content of the box

This step aims at having pupils look at the box content: the material and the notice. Children should have enough time to discover and familiarise themselves with the box. This is an important step, therefore it might be interesting to note down their assumptions, to return to them later.

## Step 5: Experiment

Carry out the experiment by following the steps in "How to create your elements".

## Step 5. Feel and sense

Why do you think the reactions in each glass differed from one another? Try using more of your senses to evaluate your three glasses; sight, touch, hearing and smell especially! Explain that the yeast alone does not react until sugar and warm water are added and mixed to create the fermentation process.



# TECHNOLOGY

## Step 5: Extension/reinvestment

To further investigate how carbon dioxide works in this process, you can mix yeast, warm water and sugar, in different quantities, in three bottles while attaching a balloon to the open mouth. The balloon will expand as the gas from the yeast fermentation rises.

Discuss real-life applications and explain fermentation in their own words.

Research: Ask your students to investigate at home how pickles, cheese or yoghurt are made.

<https://read.bookcreator.com/rNaA2HtCAOWeka31UNQIKiemmVF3/beWOuJRNruOhBgBx1Rn3cQ>



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# TECHNOLOGY

## SEQUENCE 2

Age group	9-12 y.o.
Prior knowledge	None
Material needed	Lemonade or clear soda, lemon juice, baking soda, lemon slices (optional), glass, lemon juice.
Subjects	Science, Biotechnology
Skills involved	Demonstrate the reaction between citric acid and basic baking soda, resulting in carbon oxide gas production.
Time to carry out the sequence	1 hour

### Step 1: Introduction

Start by introducing the concept of acids and bases in simple terms. Explain that acids taste sour and bases feel slippery.

Show examples of common acids (e.g., lemon juice) and bases (e.g., baking soda) found in the kitchen.

Discuss the properties of acids and bases and their reactions when mixed together.

### Step 2: Discover the box

Give the students time to observe the different parts of the box and ask them what they think can be done with the material. Explain the materials needed for the experiment: citric acid (available as lemon juice or powdered form), baking soda (sodium bicarbonate), water, small containers (cups or beakers), and balloons. Emphasise the importance of safety, such as wearing safety goggles and handling chemicals with care.



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# TECHNOLOGY

## Step 3 Storytelling

Read the story to the students. Talk students about Pasteur. Did they know him? Have they ever heard of him, or do they know the term pasteurization or pasteurized milk?

## Step 4. Experiment

Carry out the experiment by following the steps in “How to create your elements”.

## Step 5. Observation and explanation

- Observe and discuss the immediate reaction, noting the formation of bubbles and fizzing.
- Explain that this reaction produces carbon dioxide gas, which is responsible for the bubbling.

## Step 6. Extension activities

**Disclaimer:** This reaction can be dangerous and always wear safety protection.

Encourage students to ask questions and explore other reactions involving acids and bases.

Discuss real-life applications of acid-base reactions, such as in the kitchen, in cleaning products, or even in the human body (for example, in digestion). Encourage students to think about how these reactions impact their everyday lives.



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