



Micro-organisms: Useful Microbes

A yeast racing competition is used to demonstrate to students that microbes can be beneficial.

Curriculum Links

Science
Working scientifically

PSHE/RSHE
Health and prevention

English
Reading and comprehension

Key Words

Culture, Fermentation, Probiotics

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[e-bug.eu/eng/KS2/lesson/
Useful-Microbes](https://e-bug.eu/eng/KS2/lesson/Useful-Microbes)

Learning Outcomes

All students will:

- Understand that some microbes can help keep us healthy.
- Understand that some microbes can be put to good use.
- Know that microbes grow at different rates depending on their environments.



Resources Required

Main Activity: Yeast races

Per student

- ☐ 2 plastic cups
- ☐ Flour
- ☐ Yeast solution
- ☐ Sugar
- ☐ 2 Graduated cylinders (or measuring jugs)
- ☐ Basin
- ☐ Hot water
- ☐ Teaspoon

Per student

- ☐ Copy of SH1
- ☐ Copy of SW1

Extension Activity: Fill in the Blanks

Per student

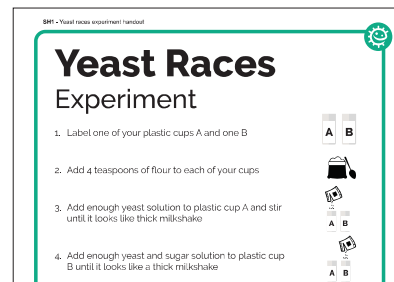
- ☐ Copy of SW2

Advance Preparation

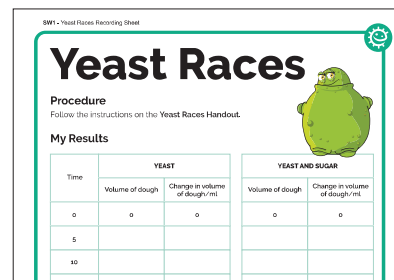
Purchase flour, sugar and dried yeast. Prior to starting the activity make up a liquid yeast solution as outlined on pack purchased. This may vary between different brands. If made too far in advance the yeast will start to ferment.

NB: do NOT add sugar until stated in the main activity.

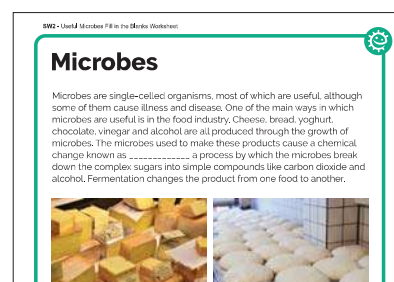
Supporting Materials



SH1 Yeast Races Experiment Handout



SW1 Yeast Races Recording Sheet



SW2 Useful Microbes Fill in the Blanks Worksheet

Lesson Plan



Introduction

1. Begin the lesson by explaining that microbes can have both harmful and useful effects on our health. Ask the class what they know about useful or 'friendly' bacteria. Many students will have already heard about probiotic bacteria in yoghurt.
2. Explain that microbes are helpful in the breakdown of dead animals and plants, in helping animals and humans digest foods and in turning milk into yoghurt, cheese and butter.
3. Highlight that bread dough rises through the action of helpful fungus known as yeast. The yeast eats the sugars present in food and produces gas and acids. These acids change the taste, smell and form of the original foodstuff whereas the gas makes the dough rise.
4. Tell the class that in this activity they are going to see exactly how we can use useful microbes to make bread rise.

Discussion

Check for understanding by asking the class the following questions:

- a. What is the process which caused the yeast mixture to rise?

Yeast growing and using the sugars for energy; the yeast produces gas bubbles which cause the dough to rise.

Start a classroom discussion on how microbes keep us healthy

- b. What would have happened if there were no live yeast in the mixture?

Nothing, it's the growing yeast that causes the breakdown of sugars and makes the dough rise.

- c. Why was the mixture kept in a basin of warm water?

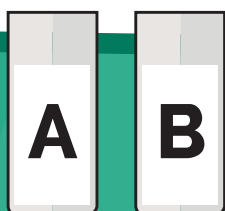
Most microbes prefer to grow at 37°C and will multiply faster if grown at this temperature. The faster the microbes grow the more breakdown of sugars will occur and the faster the yeast mixture will rise up the cylinder.

- d. What other food products are made using bacteria or fungi?

Cheese, bread, wine, beer, sour cream.

Main Activity: Test Races

1 Label 2 cups A and B. Add 4 teaspoons of flour to each cup



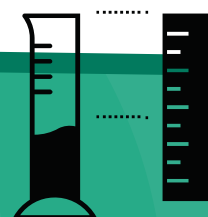
2 Add yeast to cup A and mix



3 Add yeast and sugar to cup B and mix



4 Pour each cup into cylinders and measure the height of the dough



Main Activity: Yeast Races

1. This activity is for groups of 2-5 students.
2. Highlight to the students that a useful fungus known as yeast is used to make bread. The yeast helps the bread rise through a process called fermentation.
3. Supply the class or groups with the Yeast Races Recipe (SH1).
4. Ask students to carry out the activity in their groups. When the recipe is complete, students should observe the yeast and record their observations on the student worksheet (SW1).
5. Can the class explain why the yeast and sugar solution moved faster than the yeast alone? Students should recognise that fermentation was carried out at a faster rate when the sugar was present.

Fascinating Fact

Elie Metchnikoff won the Nobel Prize in 1908 for his 'discovery' of probiotics. He was convinced that Bulgarian labourers lived longer than other people because of the microbes in the sour milk they drank. The microbes were later identified as *Lactobacillus bulgaricus*.



Extension Activity

Microbes and Food

Fill in the Blanks Worksheet

Provide students with SW2 and ask them to fill in the blanks using the correct words provided. This can be completed in the classroom or as a homework exercise.

SW2 Answers:

1. Fermentation
2. *Lactobacillus bulgaricus*
3. Yoghurt
4. Bread
5. Yeast
6. Air (CO₂)

Learning Consolidation

At the end of the lesson, ask the class the questions below to check understanding:

- ☐ Do microbes have both useful and harmful effects on our health.

Answer: Yes

- ☐ Some microbes can help keep us healthy True/False?

Answer: True

- ☐ Some microbes can be put to good use in the food industry. List five food or drink items.

