Soup's on!

Clientele: 9 to 12 years old

Type of resource: Experiment to do in class.

Objectives

The students will discover and observe the microorganisms that are present in their daily environment, notably on fruits and vegetables.

Description of the activity

Microorganisms, or microbes, are living organisms that cannot be seen with the naked eye but that are everywhere: in the air, on door handles, on furniture, etc.

Although the majority of microbes are totally harmless to humans, some of them cause the spoilage of foods such as fruits and vegetables. They multiply on the surfaces of or inside foods in such large numbers that they become visible. So what do these undesirable microbes, such as moulds, bacteria and yeasts that grow on foods look like?

Steps of the experiment

Ahead of time

Two weeks ahead of time, have the students bring to class fruits, vegetables or bread with no preservatives, as well as clear plastic resealable bags.

Fruits may include tomatoes, strawberries, blueberries, raspberries or Lychee nuts. Vegetables may include sliced cucumbers, squash, cut potatoes, cut onions or green peppers.

Preparatory questions

At the beginning of the class and before the experiment, you may wish to ask your students different questions to get them to formulate hypotheses:

- What should be done so that the microbes multiply and thus become visible on foods?
  Answer: When bread, fruits or vegetables are placed in a plastic bag, humidity increases, and this encourages the growth of microbes. The absence of direct light encourages them to grow on foods. The presence of sugar or sugar water also contributes to the development of moulds.

- Will microorganisms develop easily on food, regardless of the temperature?
  Answer: The temperature of a refrigerator considerably slows the development of moulds and bacteria on foods such as fruits and vegetables. The best temperature for the growth of moulds on foods is room temperature (20 to 25°C). As for bacteria, they like temperatures between 4 and 60°C.

- What might increase or decrease the growth of moulds and bacteria on foods?
  Answer: The type of food, the amount of sugar, storage time, the cleanliness of foods, humidity, temperature and light.

Material

- a fruit, a vegetable or a slice of bread (with no preservatives) per student;
- a spray bottle of sugar water;
- a plastic Ziploc® bag per student;
- an indelible marker.

The experiment

In class, each student places his or her food item into the plastic bag, writes the name of the food on the bag using the marker and then puts the bag either next to a window or in a cupboard, where it is dark. Those who brought slices of bread may, before putting them in the plastic bags, spray them with a solution of sugar water. After two weeks, all the participants observe the bags and take note of what they see.

Soup's on! and education programs

Quebec

Quebec education program
Target clientele: Primary

Training areas
Science and technology

General training areas	Cross-curricular competencies	Disciplinary competencies	Universe
Health and safety	Using the information, solving the problems, exercising critical judgment, communicating appropriately	Cycle 1: Exploring the world of science and technology, Cycles 2 and 3: Using the tools and procedures of science and technology, communicating in the languages used in science and technology.	Cycle 1: Living universe: Food techniques, using the living for consumption; Cycles 2 and 3: Living universe: Characteristics of the living
Environment and consumption	Communicating appropriately		

Ontario

Ontario's curriculum, from grade 1 to grade 8 – Science and technology, revised edition, 2007

Grade 6
Biodiversity