

LESSON PLAN

Yoghurt

Overview

Microbes can be used to make food and drink. In this lesson students will set up a microscope and look at bacteria from a yoghurt drink. They will use mathematical skills to record magnification and represent numbers in standard form.

National Curriculum links

KS3 Working Scientifically: Experimental Skills and Investigations

- use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety

KS3 Working Scientifically: Analysis and Evaluation

- apply mathematical concepts and calculate results

KS3 Biology: Measurement

- understand and use SI units

KS3 Biology: Cells and Organisation

- cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope
- the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts

KS3 Biology: Nutrition and digestion

- the importance of bacteria in the human digestive system

Starters

What are you looking at? (5 minutes) – Look at the image and try to determine what it shows by encouraging students to discuss with their peers. Then take their ideas through question and answer until they realise that it is a highly magnified image of bacteria.

The standard (10 minutes) – Explain to students that numbers can be very small like 0.0000000000000001 or very big like 1000000000000000. This becomes cumbersome to write these numbers. So, Standard Index Form has been developed. Explain to students how to turn a number into standard form and vice versa. You may wish to show them <https://www.youtube.com/watch?v=PzXvVRTV7lo> , which revises how to use Standard Index Form (clip is 4 minutes 28 seconds).

Main

Introduce the microscope, show students how to hold it and share the names of the key parts of the microscope. If an interactive whiteboard is available the virtual pens could be used to draw links between the keywords and their definition. You may wish to show students SciShow: *The Tube that Changed the World*.

<https://www.youtube.com/watch?v=Ue-86MDmjns> (clip 4 minutes and 40 seconds).

Allow students to prepare a smear slide of yoghurt, and then use a Gram stain to make the bacteria visible. Explain to students that the bacteria we are interested in are the rod shaped, purple bacteria. Encourage students to record their observations in a 5 cm x 5 cm box with a pencil. They should include the magnification on their work.

Plenary

Review of learning (10 minutes) – Show students the diagram of a bacterium. Ask them to pick out the key parts of the cell. Then ask them to use the diagram to suggest how the bacteria may reproduce (asexually).

Reflection (5 minutes) – Ask students to summarise their learning as a Tweet. Then share with their neighbour and finally with their table. Ask each table to report back. The best Tweet should be written in all the students' notes.