

LESSON PLAN

Micro-organisms and MicroTrumps

Overview

Microorganisms are small organisms that can only be seen under a microscope. Some of these microbes are used in the food industry such as yeast to make bread or bacteria to make yoghurt.

But some microorganisms can get into the body and cause illness and disease. When they live and reproduce in the body, they may make toxins which damages cells and tissue. The person who has the microbe is known as infected.

National Curriculum links

Year 2 Programme of Study:

- Animals, including humans

Pupils should be taught to describe the importance for humans of hygiene.

Year 6 Programme of Study

- Living things and their habitats

Pupils should be taught to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms

Starters

Yeast (5 minutes) – Give a sample of bread, fresh yeast and beer. Ask students to suggest a link (the microorganism yeast). You may wish to extend students by showing them the packaging of an oral anti-yeast medication. You could explain that sometimes yeast can grow in your mouth and this can make you ill and so a medicine is used.

Hands (10 minutes) – Ask students to explain the importance of hand washing. Ask for three volunteers to demonstrate how to wash hands, have two bowls of water (one very cold and one warm). Give two students soap and ask them to wash their hands in a different bowl, give the third student some alcohol gel. Ask students to demonstrate how they wash their hands. Then play the Washy Washy video (younger Year 2 students): <http://www.chillededucation.org/multimedia.html>.

For literacy focus students could also look at all or part of the article from <http://www.dailymail.co.uk/sciencetech/article-3530690/Scientists-reveal-wash-hands-Research-shows-six-step-process-efficient-killing-bacteria.html>, which details a recent student from Glasgow Caledonian University on the value of the WHO's six step washing process

Main

Explain to students that microorganisms are small living things. They could be one cell or a few cells. Some microorganisms are useful such as yeast used to make bread. But, some microorganisms can be dangerous and can cause illness. Show students some microscopy images of different microbes.

Students should then consider the features of the three main classifications of microorganism:

- Yeast is a single celled fungus. These microorganisms have cell membranes, hard cell wall and a nucleus. Show students a jar of yeast extract, a loaf of bread and beer and ask them to suggest a link. Use question and answer to encourage students to see that these are all safe to eat or drink but they actually rely on the same microbe – yeast – to make them.
- Bacteria have cell membranes and soft cell walls but do not have a nucleus. Some have tails which allow them to swim. Show the *Lactobacillus acidophilus* MicroTrump. This bacterium is completely harmless and is found in the healthy human gut. It's sold as a health supplement and also used by the food industry to make many fermented foods such as cheese and yoghurt.
- Viruses have no cell wall or cell membrane, they are protected by a protein coat. They do not have a nucleus but have a strand of DNA. They can only reproduce when they are inside another living cell, so some people do not think these microbes are alive. Show the norovirus MicroTrump. Norovirus is especially tough and very infectious. Hygiene is very important to its control.

Students should then use the information from the MicroTrumps and the class discussion to research or design another microorganism. They should include information about its classification, a sketch of the microbe and relevant information about where it can be found, its temperature tolerance and how ill it can make you. A worksheet which supports this is attached. Students can use it to make a labelled diagram and then colour in bars to represent the illness length and danger score for their chosen bacteria. There is an extension sheet for students to make more cards. The extension sheet needs to be printed double sided as it has the rear of the card.

Small groups of students can then have a game of MicroTrumps, where they deal out the pack of cards which could include those which have been made in the lesson. The top card for each player is turned over and viewed by that player alone. The student whose turn it is then makes a bet that their MicroTrump is best at a category which they choose. The player with the MicroTrump which has the highest value in that category wins all the cards from that round. The next player then has their turn. The object of the game is to have the most MicroTrump cards at the end of the playing time.

Plenary

Body (5 minutes) – Give students an outline of a human body. They should annotate with where microorganisms can get into the body and make someone ill (in the eyes, breaks in the skin, up the nose, in the ears and eaten).

Microbe match (10 minutes) – Match the name of the microbe, with its image, where it comes from and the illness. Use the MicroTrump cards to support students with this task.