



e-Bug

Key Words

Bacteria
Bug
Cell
Disease
Fungi
Germ
Microbe
Micro-organism
Microscope
Pathogen
Probiotic
Viruses

Materials Required

Per Student

- A copy of [SH 1](#)
- A copy of [SW 1](#)
- A copy of [SW 2](#)
- Petri dish (optional)
- Microbial images from www.e-bug.eu

Per Group

- Play dough in a variety of colours (for home made recipe see [TS 4](#))

Available Web Resources

- A demonstration film of the activity
- A variety of microbial photographs

FASCINATING FACT

Antonie van Leeuwenhoek created the first ever microscope in 1676. He used it to examine various items around his home and termed the living creatures (bacteria) he found on scrapings from his teeth 'animalcules'.

Background Information

Micro-organisms, also known as germs, bugs or microbes, are tiny living organisms too small to be seen with the naked eye. They are found almost everywhere on earth. Some microbes are beneficial and others can be harmful to humans (this will be explored in later sections). Although extremely small, microbes come in many different shapes and sizes. There are three main groups of microbes:

Viruses are the smallest of the microbes and are generally harmful to humans. Viruses cannot survive by themselves. They need a 'host' cell in order to survive and reproduce. Once inside the host cell, they rapidly multiply and destroy the cell in the process!

Fungi are multi cellular organisms that can be both beneficial and harmful to humans. Fungi obtain their food by either decomposing dead organic matter or by living as parasites on a host. Fungi can be harmful by causing infection or being poisonous to eat; others can be beneficial or harmless, e.g. *Penicillium* which produces the antibiotic penicillin. There are also fungi that are not microbes and some that can be eaten like *Agaricus*, commonly known as the white button mushroom.

Bacteria are single-celled organisms that can multiply exponentially once every 20 minutes. During their normal growth, some produce substances (toxins) which are extremely harmful to humans and cause us disease (*Staphylococcus*); other bacteria are completely harmless to humans and others can be extremely useful to us (*Lactobacillus* in the food industry), some are even necessary for human life such as those involved in plant growth (*Rhizobacterium*). Harmless bacteria are called non-pathogenic, while harmful bacteria are known as pathogenic. Over 70% of bacteria are non-pathogenic.

Bacteria can be simply divided into three groups by their shapes – cocci (balls), bacilli (rods) and spirals. Cocci can also be broken down into three groups by how the cocci are arranged: staphylococci (clusters), streptococci (chains) and diplococci (pairs). Scientists use these shapes to tell which infection a patient has.

Advance Preparation

- Prepare a copy of [SW 1](#) and [SW 2](#) for each student.
- Prepare [SH 1](#) poster for the classroom or on the white board.
- Purchase or follow the recipe in [TS 4](#) to make play dough in a variety of colours.
- Download a variety of microbe images from www.e-bug.eu for student viewing.

