



What are microbes?

Microbes are living things that can only be seen with the help of a microscope.

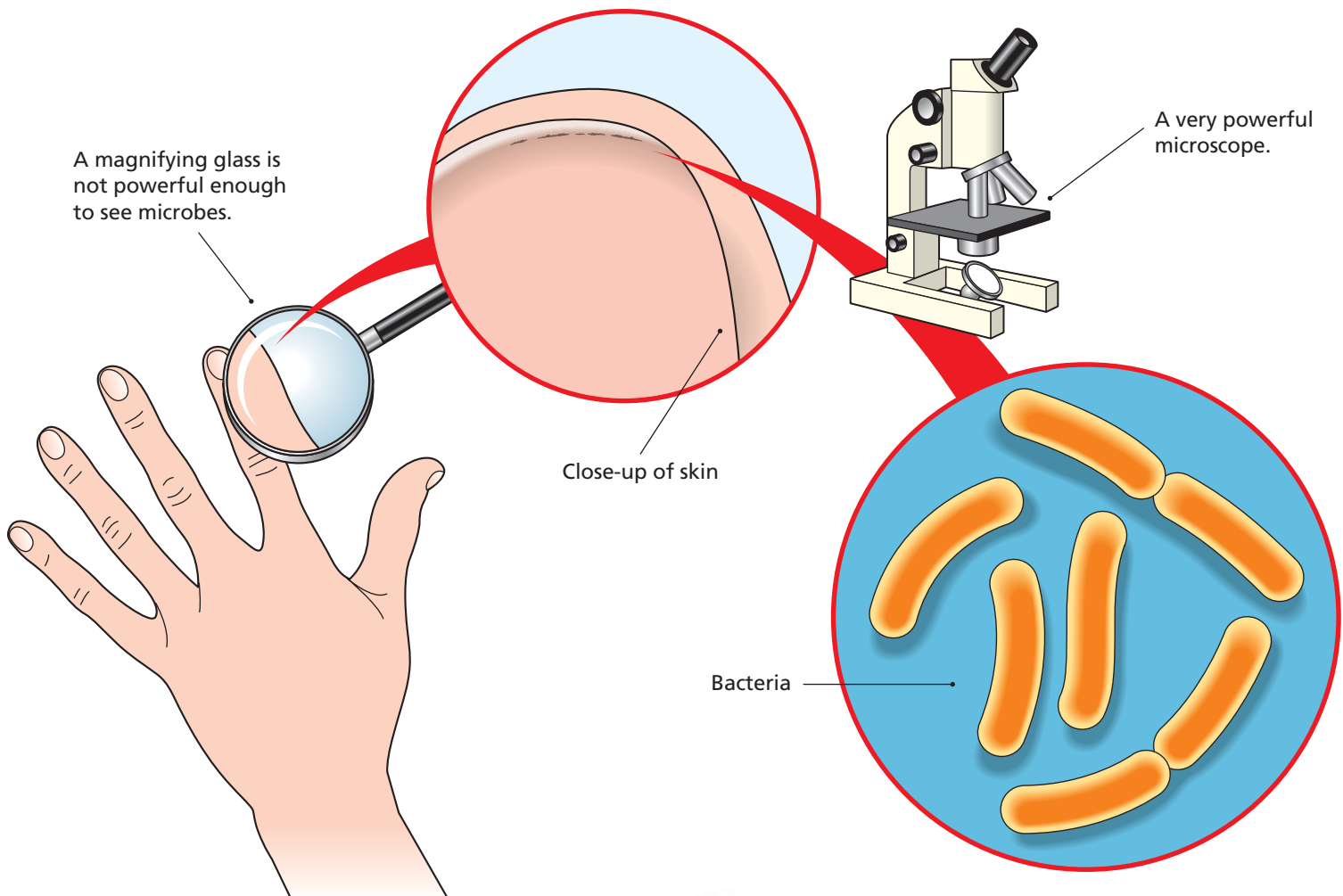
It is a curious fact that the **MICRO-ORGANISMS**, or **MICROBES**, alive today are the descendants of the very first life formed on Earth 3 billion years ago. Today, they are still the most common form of living thing in the world.

Microbes are invisible unless you look through a powerful **MICROSCOPE** (Picture 1). In fact, people have only known about microbes since 1673. This was the year the microscope was invented.

The importance of microbes

Everything you see – the pages of this book, your fingers, your teeth, your food – is covered with microbes. You may not be able to see them without a microscope, but you have certainly been affected by what they do.

▼ (Picture 1) Microbes are living things too small to be seen. The word covers a wide range of tiny living things.





◀ (Picture 2) This water is green because it contains millions of tiny microbes called algae. They are not harmful in themselves, but they are an indication that the water is becoming stagnant and might therefore contain many other unseen but harmful microbes too.

A single teaspoon of soil contains over 1,000,000,000 **BACTERIA**, about 120,000 **FUNGI** and 25,000 **ALGAE**. If all the microbes living on the Earth could be gathered in one place, they would take up more space than all the world's animals!

Microbes are responsible for, among many other things, the rising of dough, the fermenting of wine and beer, the flavour of cheese, the green colour of stagnant water (Picture 2), the flu, the common cold and for really terrifying diseases such as smallpox, polio, tuberculosis and Aids.

As you can see, microbes can be responsible for good things and bad. We call disease-producing microbes **GERMS**. However, good or bad, the fact is that without most of these microbes all plants and animals would stop living.

What do microbes look like?

A microbe looks like nothing else on Earth. It doesn't look like any plant or any animal. Microbes sometimes behave

a bit like plants (some can make their own food) and a bit like animals (some microbes eat others).

Most microbes are very simple creatures. Even the biggest are made of just a single **CELL**, usually less than one tenth of a millimetre across.

Microbes have a skin-like wall that surrounds them. Inside this wall is a fluid, and in the fluid are the substances needed for life. Many cells also have long, whip-like tails which spin like propellers and move the cells about.

Grouping microbes

Although microbes come in many shapes and sizes, they all fit into one of five main groups: bacteria, **VIRUSES**, fungi, algae and **PROTOZOA**. What microbes look like, and what they do, is described in the rest of this book.

Summary

- Microbes are too small to be seen by eye.
- Microbes that cause disease are known as germs.