Classifying Organisms

Learning Objective:

To explore what micro-organisms are and how they can be grouped.

Kingdoms are the broadest groups in the classification system. We have already looked at the 'animal' and 'plant' kingdoms.

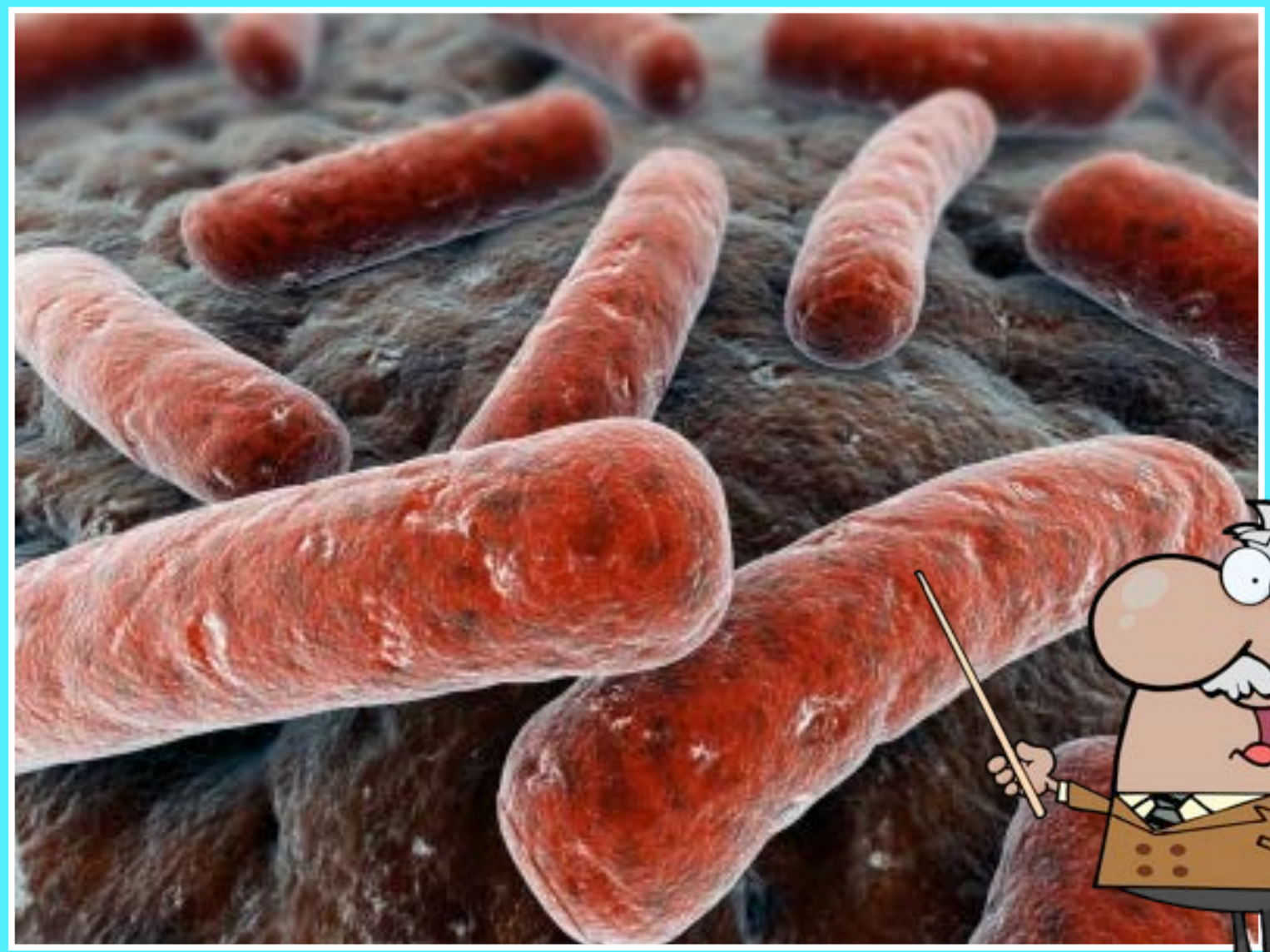
What do you think might be in the other three kingdoms?

There are millions of organisms all around us that we cannot see. They are called micro-organisms, or microbes for short.

Can you explain what a micro-organism is?

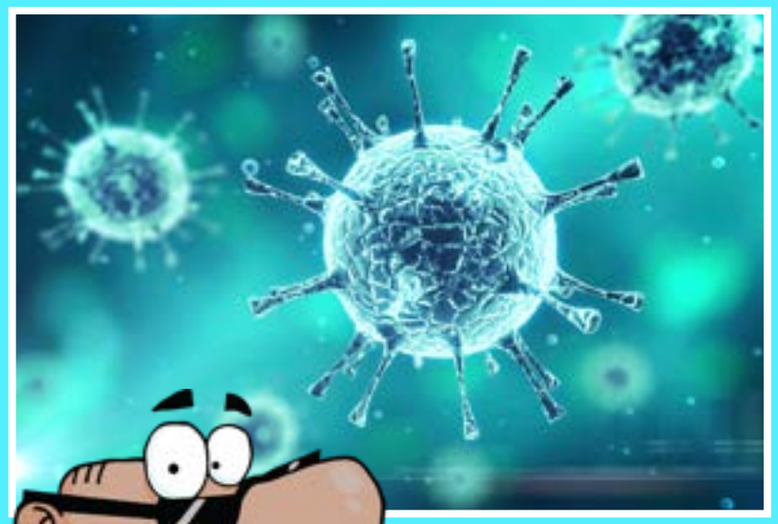
Can you think of any examples of micro-organisms?

A micro-organism is living thing that is too small to be seen with the naked eye. In order to see micro-organisms we have to use powerful microscopes. Micro-organisms include bacteria, fungi and viruses.



This picture shows what bacteria looks like when they are magnified to be thousands of times bigger than their actual size.

Just like plants and animals, micro-organisms need certain things to survive. They need water and food but some create their own food, like plants do, while others feed off the objects around them. Some also need oxygen. Different types of micro-organisms can survive in different places. Some live in freezing conditions, others in boiling hot temperatures.



Micro-organisms are just as varied as plants and animals, if not more so.

We can see the evidence of micro-organisms all around, even if we can't actually see the microbes themselves. Can you guess how these pictures show evidence of micro-organisms?

There are billions of microbes on and in your body. Most of these microbes are necessary for us to stay healthy. However, some microbes get into our systems and cause us to become ill. These microbes can then travel from person to person, making lots of people poorly. These diseases can range from mild illnesses like colds and chicken pox to much more harmful illnesses like food poisoning, cholera, hepatitis and many, many more.

These diseases can be spread through coughs, sneezes and dirty surfaces, which is why it is so important to wash your hands and keep surfaces clean.

Microbes are why foods rot and go mouldy. Even though it isn't very nice seeing or smelling mouldy food, having foods broken down by micro-organisms is very important. The mould you can see on food is the fungi feeding and growing.

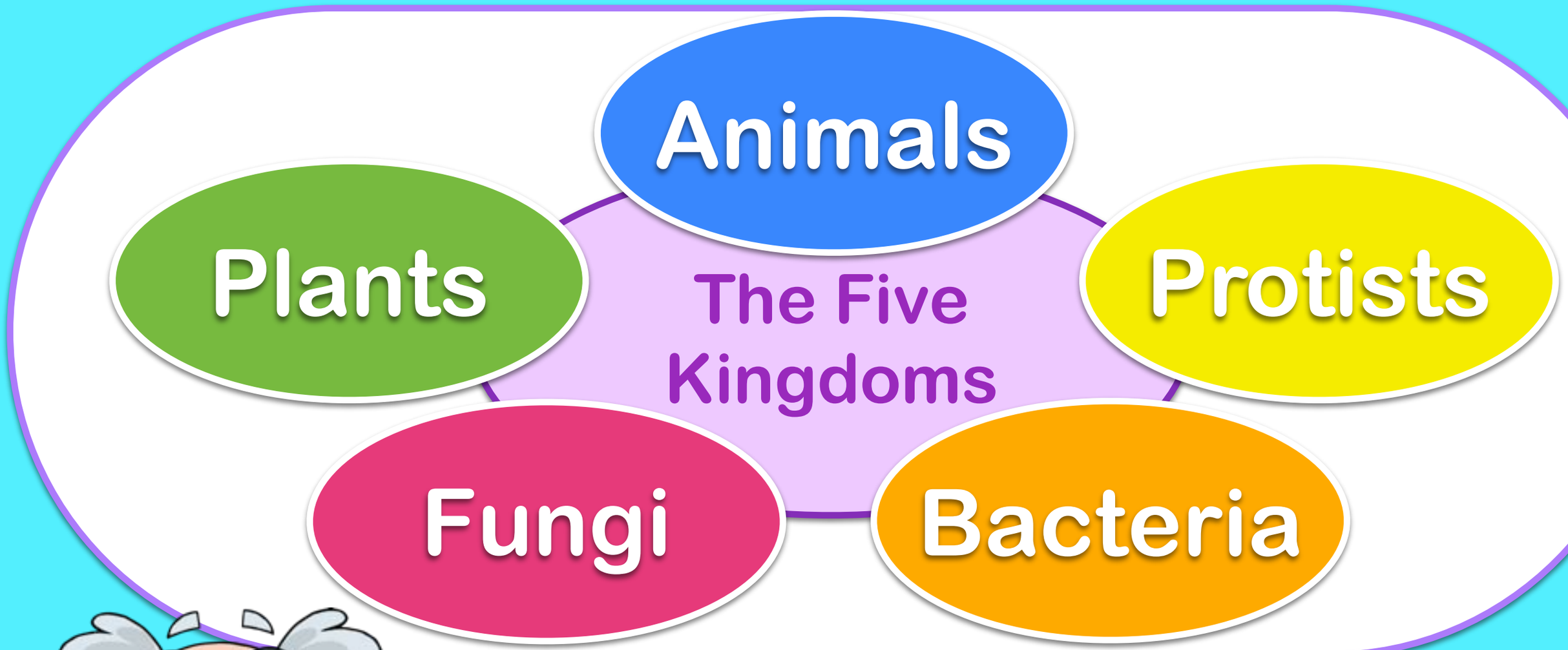
Eating mouldy food can make you very ill.

However, some moulds are specifically cultivated to make food, such as the blue veins in blue cheese. These moulds are safe to eat.

Micro-organisms are also used a lot in other types of food production. Cheese and yogurt, for example, use lactic acid to turn them into these products from milk. Wine and beer need yeast to be brewed. Bread needs yeast to make it rise.

The holes in bread are air bubbles. These bubbles are produced by yeast. Yeast is a micro-organism that is used in bread-making to make the bread rise. The yeast feeds on the bread and then produces CO^2 gas which forms the air bubbles. The more the yeast feeds on the dough, the more gas will be produced and the more the bread will rise.

As we have seen, there are lots of different types of micro-organism and they need to be classified, just as plants and animals are.



Let's have a look at the differences between fungi, bacteria and protists...

Protists

Protists are micro-organisms that are usually made up of just one cell. Protists usually live in water and stay in one place. They can include algae and amoeba.

Fungi

Fungi need to absorb nutrients from their surroundings to survive. Examples of fungi includes mushrooms, mould and yeast.

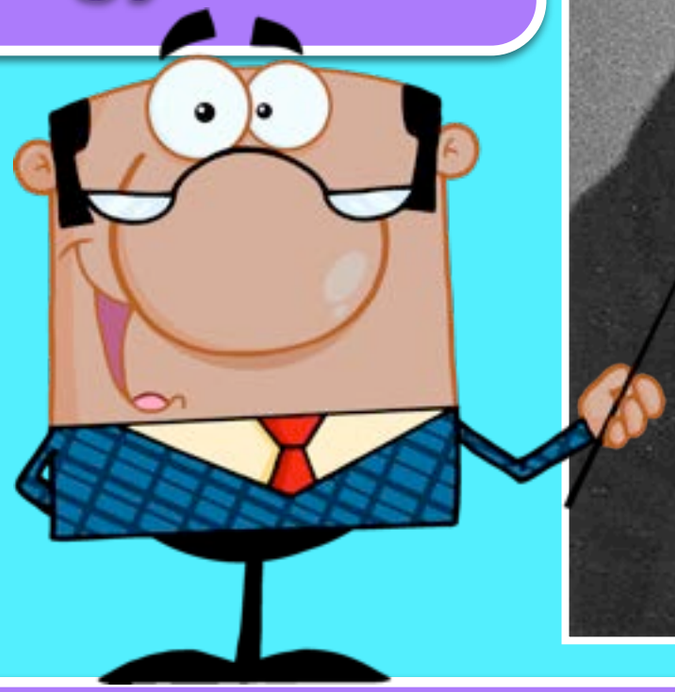
Bacteria

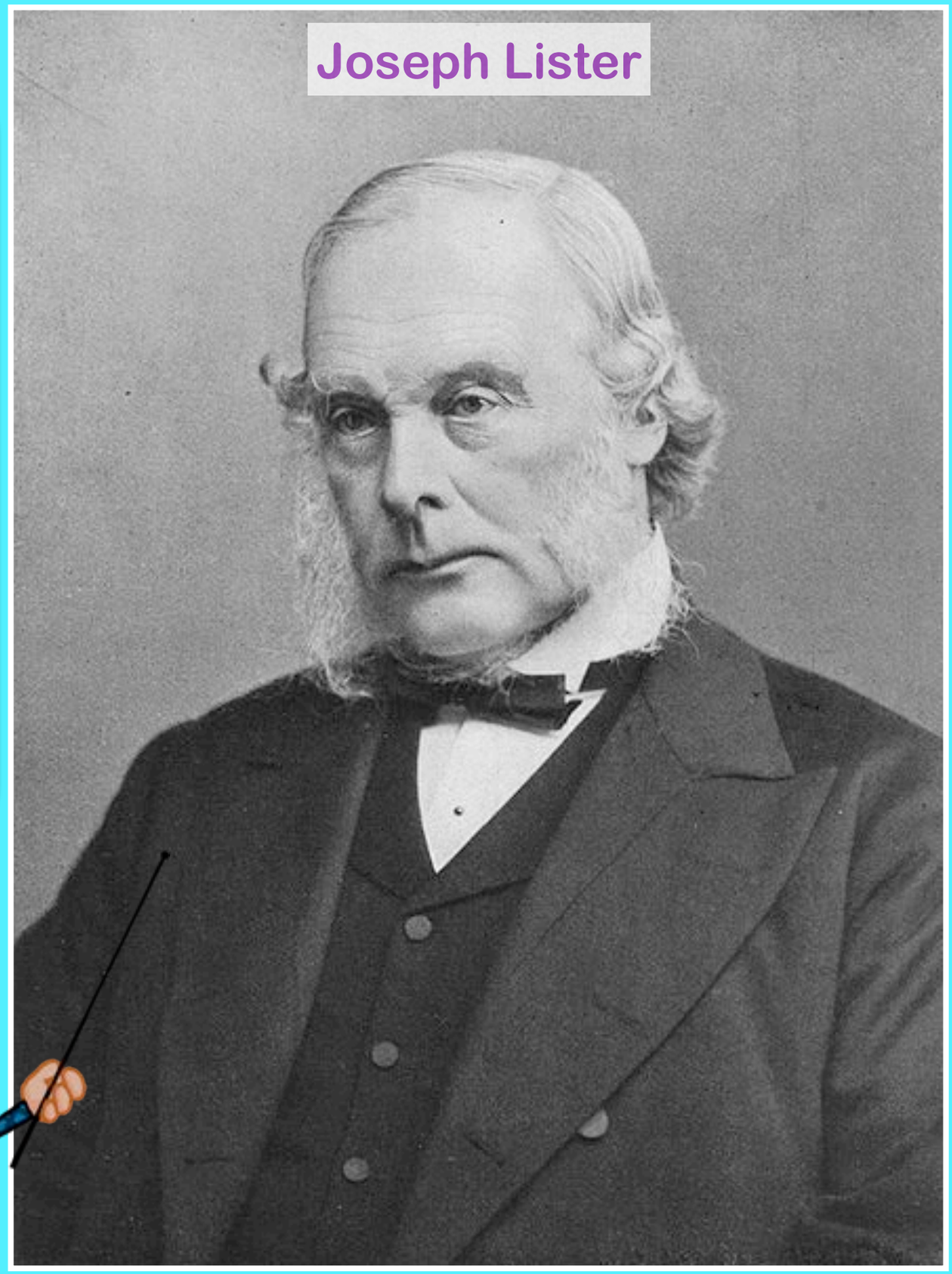
Bacteria form the largest group of any kingdom by far. Bacteria can be used in food production, such as to turn milk into yoghurt. They can also cause diseases.

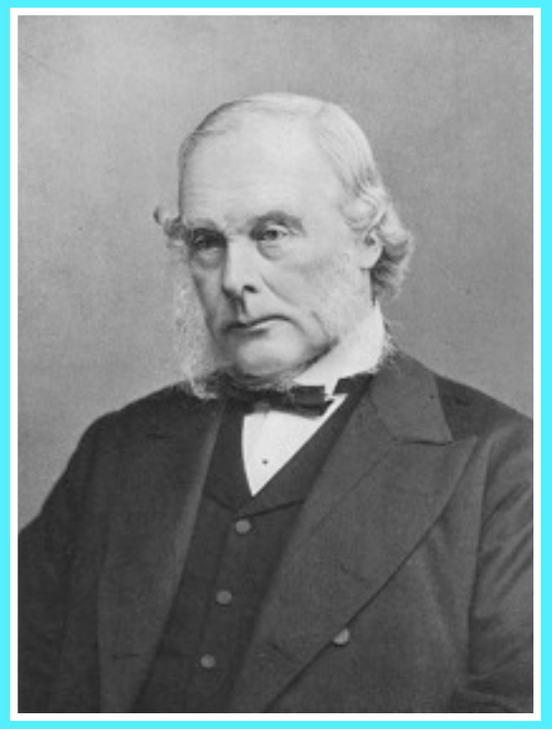
Good work everyone! Are you ready to go and be microbiologists on your own?

Plenary:

It wasn't until the early 19th century that scientists started to understand about micro-organisms. This is Joseph Lister...let's find out about his work with microbiology...







Joseph Lister was born in 1827 and when he was 26 he entered the Royal College of Surgeons. He became Professor of Surgery at Glasgow University. He was all too aware that many patients survived the trauma of surgery but then later died from what was known as ‘ward fever’. At this time, people thought that infection was caused by pollution in the air.

Lister did some experiments and found that if wounds, hands and instruments were clean then the patients did not contract infections. He used carbolic acid to sterilise instruments and clean wounds, thus inventing antiseptics. Cases of infection reduced rapidly. This was because the micro-organisms that caused the infections were killed by the carbolic acid. Before this, surgeons would often treat a patient with an infection and then see another patient without washing their hands which would spread disease.

If you could go back in time, what would you tell people about micro-organisms and how you can prevent diseases and infections from being spread?