



**Resource:** Resource 30 – Microbes Heroes or Villains?  
**Text:** Use this resource to learn more about the different types of microbes that exist and how they are used. This resource involves literacy skills and considers topical science.  
**Suitable for:** P7/S1/S2  
**Approximate time:** 30 minutes  
**Curriculum links:** LIT 3-05a, LIT 4-05a, LIT 3-06a, LIT 4-06a  
**Meta-skills:** Focussing: Attention. Curiosity: Observation.

**Sustainable Development Goal links:**



## Microbes: Heroes or Villains?

Microbes have a bad reputation when it comes to food. No one wants to eat something covered in 'germs'. But did you know that microbes can be good for us, and are even used to make some of our favourite foods?

LOVE  
FOOD  
hate waste

### What are microbes?

The smallest living things on our planet – most can only be seen with a microscope.

There are three main types of microbes: fungi (including yeasts and moulds), bacteria and protists. They are as different from one another as animals are different from plants.

### What do microbes do?

Like all living things, they spend their time feeding, respiring, excreting and reproducing (making copies of themselves). When they do these things inside our bodies, some microbes harm us – but only 5% of microbes can cause diseases. Most microbes living inside our bodies help us. Microbes are useful to humans in other ways too.

### When are microbes food villains?


Foods that humans eat make great habitats for microbes. With all that food and moisture, they can multiply quickly – especially if the food is warm. If they happen to be disease-causing microbes, such as **Salmonella** bacteria, this can make the food very dangerous to eat. Microbes excrete all sorts of different substances. Some of these are toxic for humans. Some make food taste or smell bad. Even harmless microbes can spoil food by causing it to go stale or decay.

### When are microbes food heroes?


Microbes can change the taste or texture of foods in good ways or help foods last longer. We can also use microbes as tiny factories to produce food additives. Here are a few ways that microbes are helpful in the kitchen:



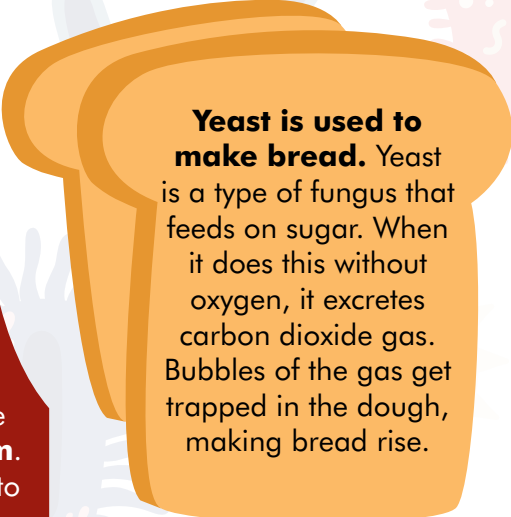
**Fungi are added to some cheeses** to give them a special taste and texture.



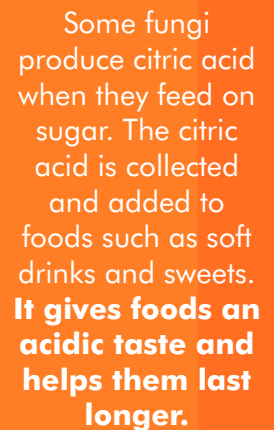
**Bacteria are added to milk to make yoghurt and cheese.** The bacteria feed on sugars in the milk and excrete lactic acid. This acid makes the milk thicker and gives it a sour taste. It also helps to stop other, harmful microbes from growing.




Bacteria is used to make **xanthan gum**. This is added to foods such as tomato ketchup and ice cream to make them thick and oozy.



**Yeast is used to make bread.** Yeast is a type of fungus that feeds on sugar. When it does this without oxygen, it excretes carbon dioxide gas. Bubbles of the gas get trapped in the dough, making bread rise.



Some fungi produce citric acid when they feed on sugar. The citric acid is collected and added to foods such as soft drinks and sweets. **It gives foods an acidic taste and helps them last longer.**



**Chocolate can't be made without microbes.** Yeasts and bacteria feed on the pulp around harvested cocoa beans. This helps to give chocolate its flavour

# Task

What are the 3 main types of microbes?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Use the table to list when microbes are used for good reasons (heroes) or bad reasons (villains).

HEROES	VILLAINS