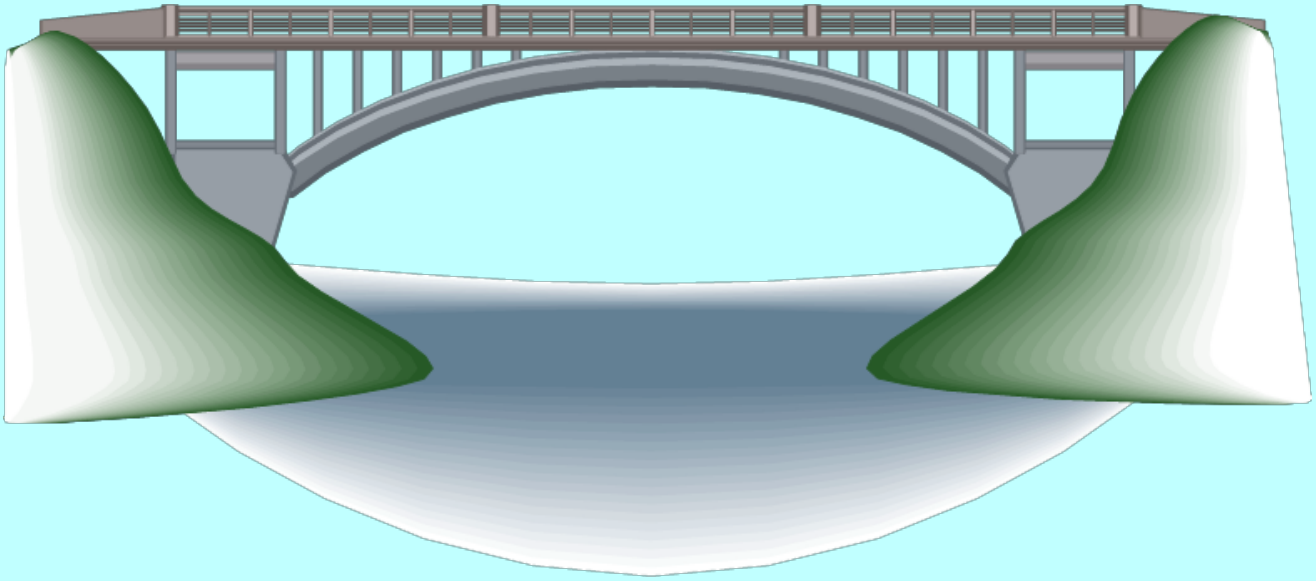
10.2.21

LO: To understand howhow mirco-organisms can be helpful and beneficial

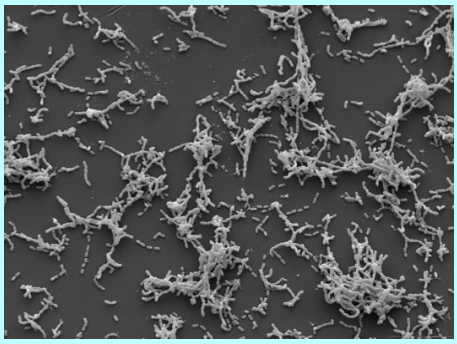
Success Criteria

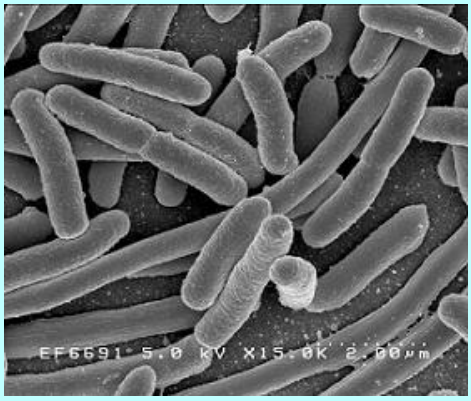
1:	2:	3:
I can explain what the different types of mirco-organisms are	I can give reasons why they are useful	I can give reasons why they are harmful



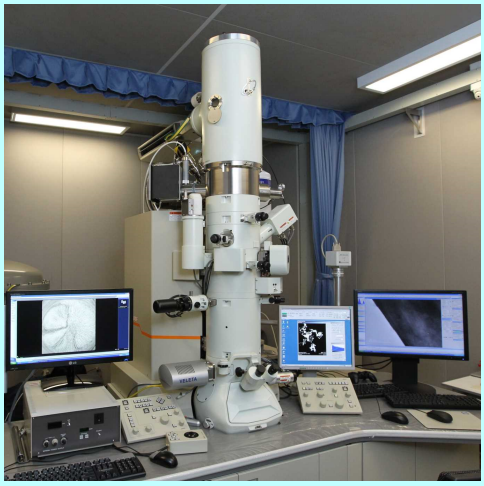
Micro Organisms

Micro = small
Organism = living thing





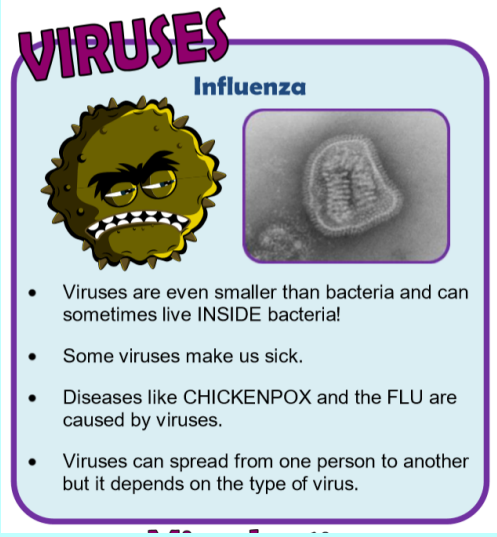
Micro-organisms, also known as germs, bugs or microbes, are tiny living organisms too small to be seen with the naked eye. They are found almost everywhere on earth. Some microbes are beneficial and others can be harmful to humans. There are three main groups of microbes: viruses, fungi and bacteria.



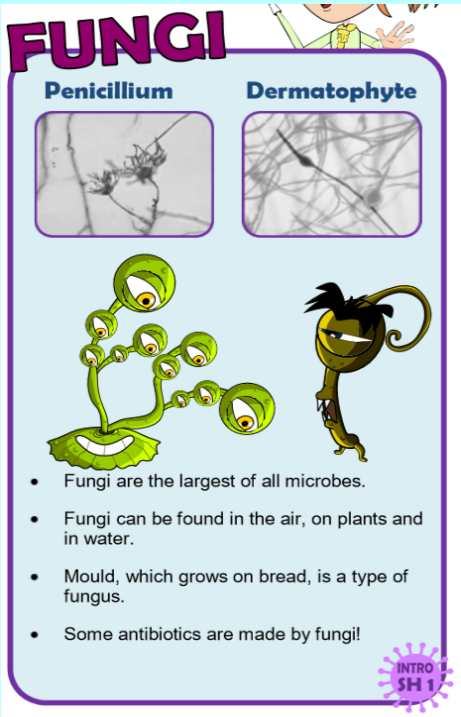
https://www.bbc.co.uk/bitesize/clips/ztvfb9q

Watch this link to find out about microbes on our skin (The link is on the Year 6 home learning page).

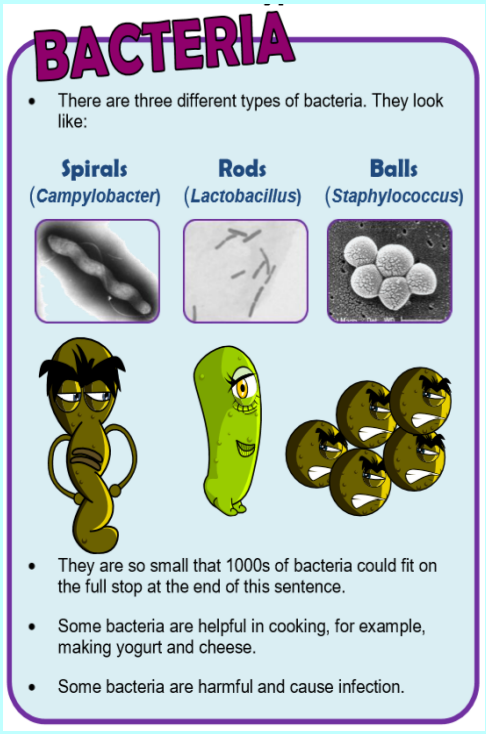
Viruses are the smallest of the microbes and are generally harmful to humans. Viruses cannot survive by themselves. They need a 'host' cell in order to survive and reproduce. Once inside the host cell, they rapidly multiply and destroy the cell in the process!



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 rapidly. During their normal growth, some produce substances (toxins) which are extremely harmful to humans and cause us disease; other bacteria are completely harmless. Harmless bacteria are called non-pathogenic, while harmful bacteria are known as pathogenic. Over 70% of bacteria are non-pathogenic.

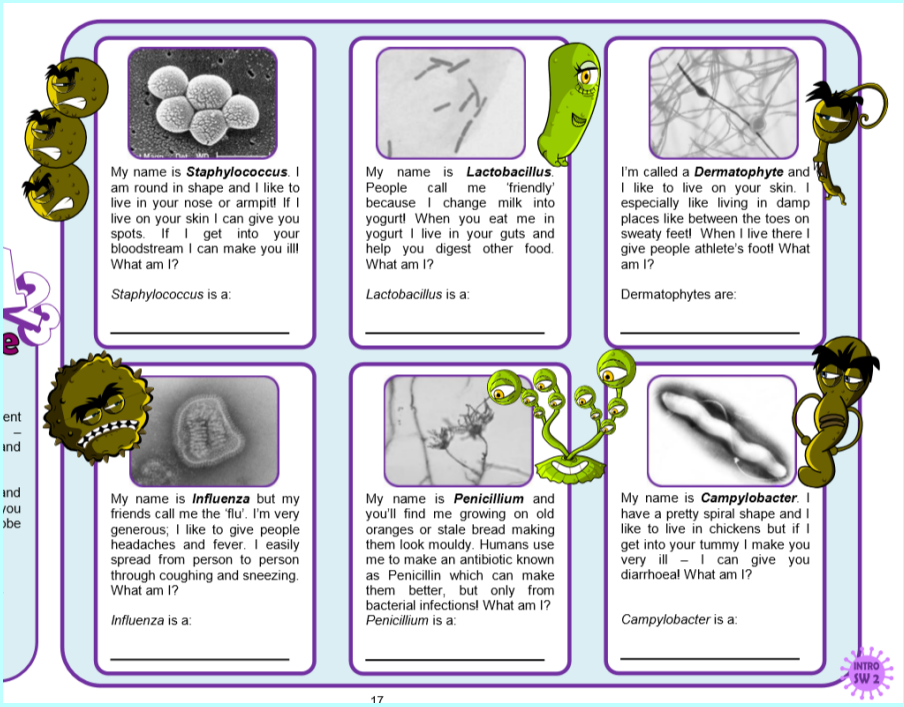


TASK 1:

Can you identify what these microbes are?

- Virus
- Fungi
- Bacteria

Sheet is on the Year 6 home-learning page



Now read through the powerpoint slides - harmful microbes - and find out about the harmful effects of microbes on the body.

Powerpoint is on the Year 6 home-learning page.

Task 2:

Match pictures of illnesses to the microbe that caused it.

Super challenge - can you do some reseach to find out and explain some information about the different illnesses

Picture match sheet is on the Year 6 home-learning page.

What is going on here?

https://www.bbc.co.uk/bitesize/clips/zwx76sg

Watch this video to find out about the affect of microbes on our food.

(The link is on the Year 6 home learning page).

Time-lapse photography is used to record the process of fruit decaying in a fruit bowl. At the beginning the fruit is fresh but over time the mould and microorganisms gradually break it down.

However, not all microorganisms are harmful ...

What links these three foods?

Helpful micro-organisms

Some micro-organisms are very useful in **making food**. All the foods shown here are made using micro-organisms.

Yeast is used to make beer and bread. **Bacteria** is used in the production of yoghurt.

Yeast is a micro-organism that is used to make some kinds of bread.

The bread **dough** needs to be kept warm to help the yeast grow.

As the yeast grows, it feeds on **sugar** in the bread dough and makes a **gas**.

The gas makes the dough rise and when the bread is cooked you can see lots of tiny holes in the bread formed by **bubbles** of gas.

HARMFUL MICROORGANISMS	BENEFICIAL MICROORGANISMS
 salmonella found on raw chicken	penicillin 
E coli found on raw meat 	
ringworm 	bacteria that turns milk to yogurt 
athletes foot 	yeast for making bread 
 red algae	 bacteria is a cow's stomach that allows the cow to digest grass
strep bacteria 	 bacteria in your intestines used in digestion

Although some microbes cause illness and disease, most are beneficial. One of the main ways in which microbes are beneficial is in the food industry. Cheese, bread, yogurt, chocolate, vinegar and alcohol are all produced through the growth of microbes. The microbes used to make these products cause a chemical change known as fermentation – a process by which the microbes break down the complex sugars into simple compounds like carbon dioxide and alcohol. Fermentation changes the product from one food to another.

Fermentation in action

The yeast, *Saccharomyces cerevisiae*, is used to make bread and dough products through fermentation. In order to multiply and grow, yeast needs the right environment, which includes moisture, food (in the form of sugar or starch) and a warm temperature (20° to 30°C is best). As the yeast ferments it gives off gasses which get trapped in the dough and the lump of dough expands.

TASK 3: Having read through the slides, can you answer these questions:

a. What is the process which causes a yeast mixture in a bread dough to rise?

b. What would have happened if there was no yeast in the bread dough?

c. Why does yeast need to be kept in a warm place?

d. What other food products are made using bacteria or fungi?

ANSWERS:

a. What is the process which causes a yeast mixture in a bread dough to rise?

As the yeast grows, using the sugars for energy, it produces gas bubbles which cause the dough to rise. This process is called fermentation.

b. What would have happened if there was no yeast in the bread dough?

Nothing, it's the growing yeast that cause the breakdown of sugars and makes the dough rise.

c. Why does yeast need to be kept in a warm place?

Most microbes prefer to grow at 37°C and will multiply faster if grown at this temperature. The faster the yeast grows, the more breakdown of sugars will occur and the faster the dough will rise.

d. What other food products are made using bacteria or fungi?

Cheese, bread, wine, beer, sour cream.

Choice challenge: can you use yeast (a helpful microbe) to make something in your kitchen?

- bread
- pizza

Remember: ask for an adult's permission to do this, and even better, get them to help you if they are free.

- Prep:15 mins
- Cook:35 mins
- Plus rising

Ingredients:

- 500g flour (use whichever flour you like, granary, wholemeal or white)
- 7g sachet fast-action dried yeast
- 1 tsp salt
- 2 tbsp olive oil
- 1 tbsp clear honey

Method

- STEP 1

Tip the flour, yeast and salt into a large bowl and mix together with your hands. Stir 300ml hand-hot water with the oil and honey, then stir into the dry ingredients to make a soft dough.

- STEP 2

Turn the dough out onto a lightly floured surface and knead for 5 mins, until the dough no longer feels sticky, sprinkling with a little more flour if you need it.

- STEP 3

Oil a 900g loaf tin and put the dough in the tin, pressing it in evenly. Put in a large plastic food bag, and leave in a warm place to rise for 1 hr, until the dough has risen to fill the tin and it no longer springs back when you press it with your finger.

- STEP 4

Heat oven to 200C/fan 180C/gas 6. Make several slashes across the top of the loaf with a sharp knife, then bake for 30-35 mins until the loaf is risen and golden. Tip it out onto a cooling rack and tap the base of the bread to check it is cooked. It should sound hollow. Leave to cool.

Remember: ask for an adult's permission and take care in the kitchen

Attachments

Edward Jenner Story.mp4

microbes_lesson_2_ppt.ppt

Session_2_pics_illnesses_to_match.doc