

Living things in their habitats

Lesson 3:

I can describe and investigate harmful and helpful microorganisms.

Success Criteria:

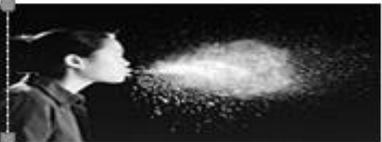
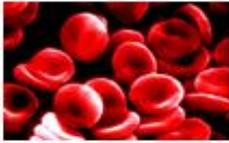
*I can identify different types of microorganisms

*I can describe helpful and harmful microorganisms

*I can plan an investigation using the scientific method

Vocabulary:

MICRO-ORGANISMS

<p>Glossary</p> <p>bacteria – micro-organisms that can be divided into two groups – harmful or beneficial</p>	 <p>fungi</p>	 <p>mould</p>	 <p>yeast</p>	 <p>Immunisation builds resistance to harmful micro-organisms and helps protect us from disease.</p>	 <p>Micro-organisms can only be seen under a strong microscope and are also known as microbes</p>	<p>infection – the process by which harmful micro-organisms enter</p>
<p>beneficial bacteria – these bacteria do useful jobs in our bodies and in our environment e.g. the bacteria in our digestive systems that help with the breakdown of food</p>	 <p>Microscope</p>	 <p>Beneficial bacteria are useful to us</p>	 <p><u>This harmful bacteria</u> causes infection and makes you poorly.</p>	 <p>A single celled organism only has 1 cell; this one is found in plankton in the sea and is called Radiolarian.</p>	 <p>We humans are multi-cellular organisms</p>	<p>microbe – another word for a micro-organism</p>
<p>cell – the building blocks of all organisms</p> <p>decay – the process of rotting of plant and animal material that is caused by bacteria and fungi e.g. tooth decay, composting</p> <p>disease – illness brought about by infection with micro-organisms</p>	 <p>Good hygiene helps protect us from disease.</p>	 <p>Compost is a result of the decay of rotting plant and animal material</p>	 <p>Washing hands is good hygiene.</p>	 <p>A high speed photo of a sneeze</p>	<p>micro-organisms – very small living organisms that can only be seen under a <u>high powered</u> microscope</p>	<p>microscope – an instrument that is able to magnify an image</p>
<p>fungi – group of organisms that includes moulds and mushrooms. Some microscopic fungi can be harmful e.g. athlete's foot fungi, some are useful e.g. yeast</p> <p>germ – a popular term for any micro-organism that makes you ill</p> <p>good hygiene – behaviour that will reduce the risks of infection e.g. washing hands</p>	 <p>Human red blood cells</p>	 <p>Germ is a popular term for micro-organisms which can cause illness and disease</p>	 <p>A virus is extremely small and causes illness. The picture below shows influenza, commonly known as flu</p>	<p>multi-cellular organism – an organism that is made up of many cells e.g. humans, insects, fish etc.</p>	<p>mould – a fungi that assists in the process of decay – green moulds are visible on the surface of rotting fruits</p>	<p>single celled organism – an organism that is made up of only one cell e.g. yeast</p>
<p>harmful bacteria – these bacteria can cause illness and disease</p> <p>illness – the symptoms of a disease, <u>accident</u> or injury</p> <p>immunisation – a medical procedure that involves giving a body resistance to certain micro-organisms</p>	<p>yeast – a microscopic single celled fungi that produces carbon dioxide which is useful for making bread and beer</p>				<p>virus – extremely small micro-organism (smaller than bacteria – a million in a row would measure only 5mm) <u>that</u> can only grow and reproduce within the cells of other organisms causing illness e.g. rhinovirus is micro-organism causing the common cold</p>	

What Are Microorganisms?



<https://www.bbc.co.uk/bitesize/topics/zfxxsbk/articles/zsgtrwx>

What Are Microorganisms?

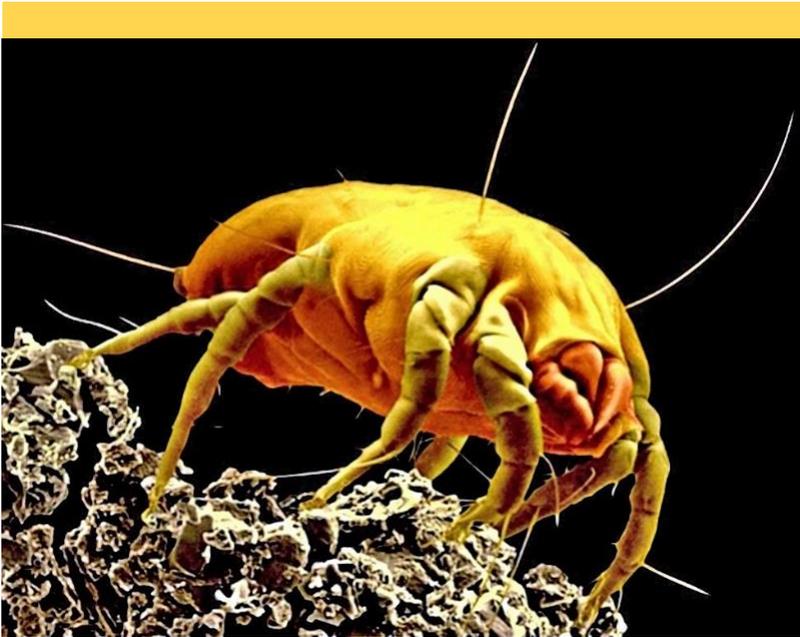


Microorganisms are very tiny living things. They are so small that they are not visible to the naked eye, so a microscope is needed to see them.

Microorganisms can be found all around us. They can live on and in our bodies, in the air, in water and on the objects around us. They can be found in almost every habitat on Earth.

What Are Microorganisms?

- Some animals and plants are microorganisms. Examples include dust mites and plankton.



A magnified image of a household dust mite.



Plankton are microscopic organisms drifting in fresh or sea water, including plants and animals.

What Are Microorganisms?

- Other microorganisms are fungi, such as mould, yeast and Penicillium. Can you write the correct definition under the correct picture?



Penicillium fungus is used to make the antibiotic penicillin.

Yeast is a microscopic fungus that can be used to raise bread dough.

Mould is the common word for any fungus that grows on food or other materials.

What Are Microorganisms?

- How did you do?



Mould is the common word for any fungus that grows on food or other materials.

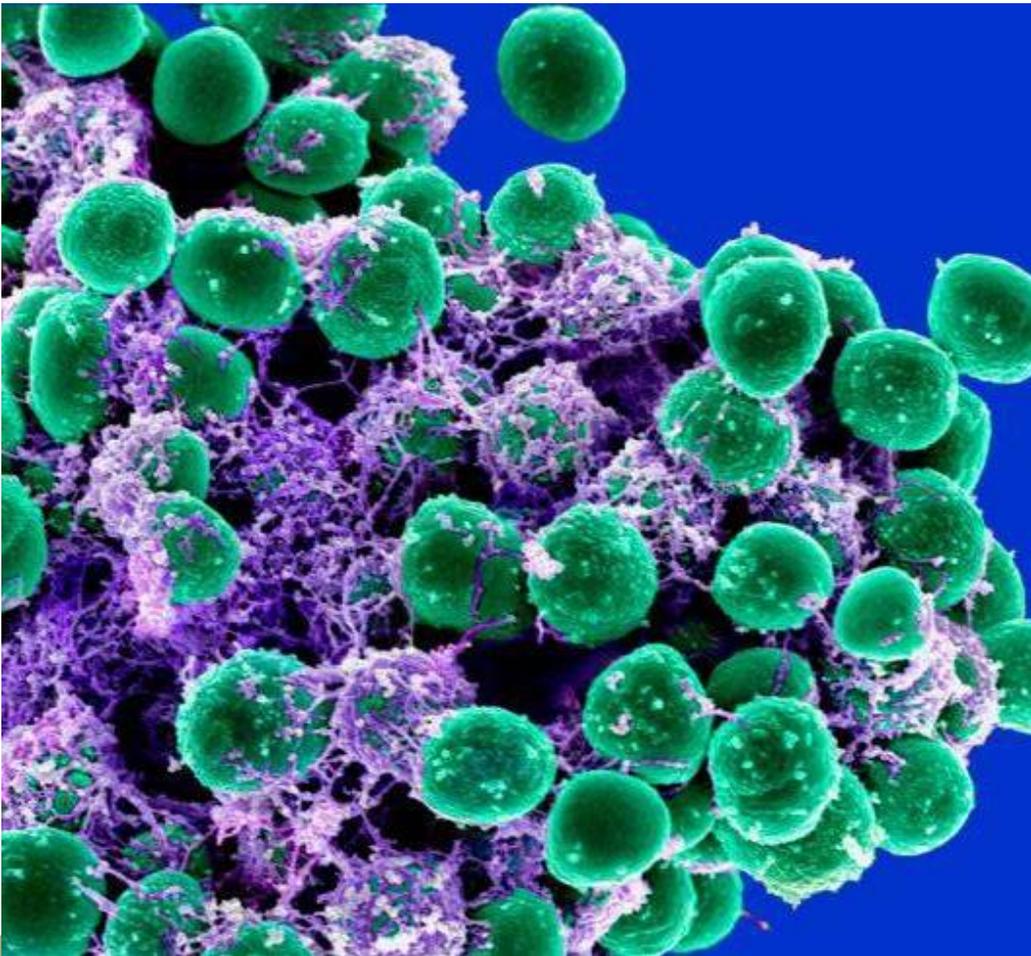


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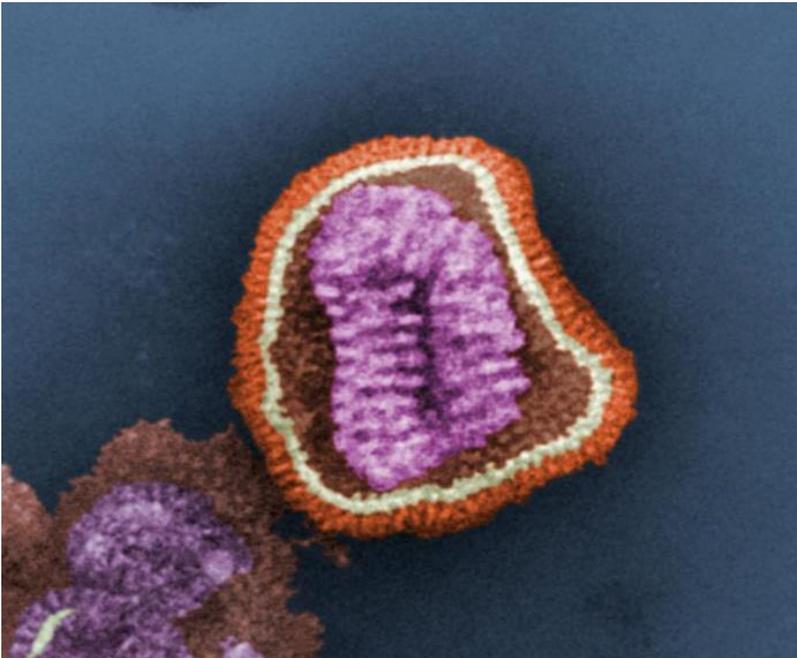
What Are Microorganisms?



Bacteria are single-celled microorganisms. Bacteria are found in diverse habitats all over the Earth.

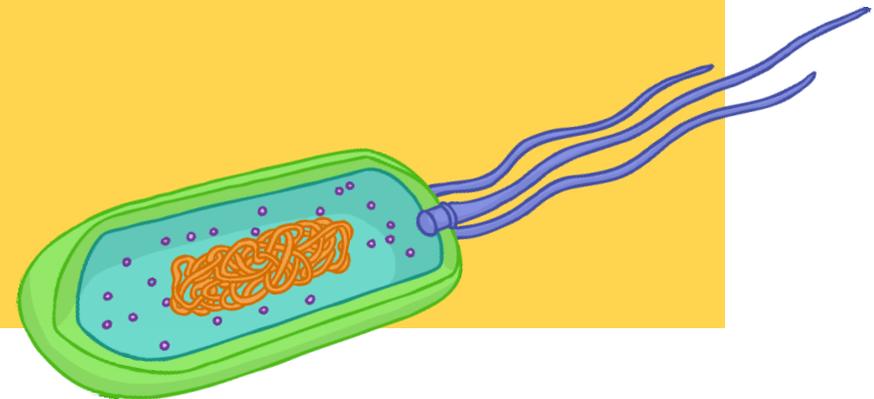
This image was produced by a scanning electron microscope. It shows a clump of staphylococcus epidermidis bacteria that is typically found growing on human skin, usually harmlessly.

What Are Microorganisms?



This image is a scanning electron micrograph of an influenza virus particle. This microorganism could cause you to have the flu.

Sometimes viruses are called microorganisms, but they are not really alive. They are infectious agents that can replicate only inside the cells of living things. Scientists disagree on whether or not to call viruses microorganisms. In this lesson we will consider them to be unusual microorganisms.

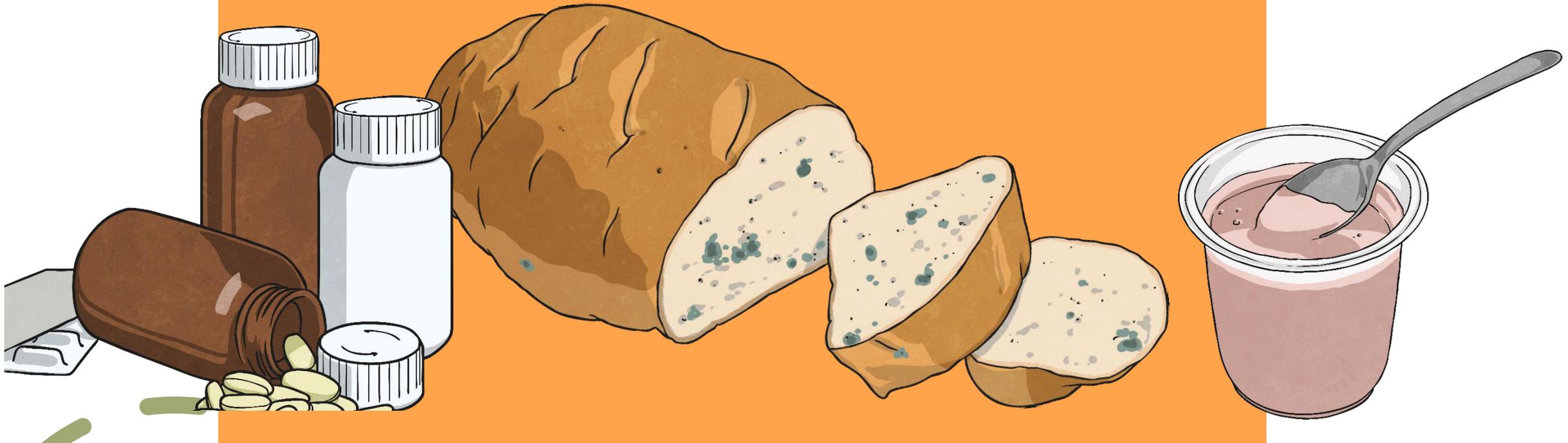


Helpful or Harmful?

- Write your thoughts on whether or not microorganisms are harmful or helpful. Remember to explain fully giving reasons.

Helpful or Harmful?

Some microorganisms can be helpful in certain situations. Others can be harmful, and their spread needs to be controlled or contained.



Helpful or Harmful?

These examples show some of the helpful uses of microorganisms.



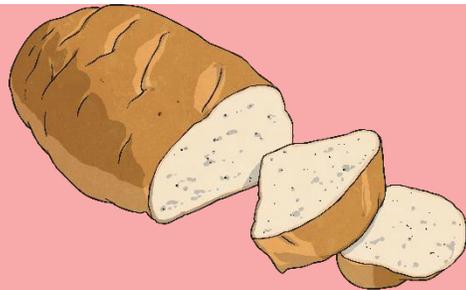
Bacteria are used to ferment milk as part of the cheese making process.



Yeast ferments the carbohydrates found in grapes to make alcoholic wine.



Yoghurt is made using milk that has been soured by bacteria.



Yeast is added to bread dough to make it rise.



Microorganisms feed on leaves, plants and other matter, decomposing it and creating compost.



Antibiotics are used to kill bacteria that cause infections. They are created from fungi such as Penicillium.

Helpful or Harmful?

These examples show how microorganisms can be harmful to us. Harmful microorganisms are often called germs.



Food poisoning can be caused by bacteria that grow on uncooked or undercooked food.



Chicken pox is caused by a virus. It spreads very easily.



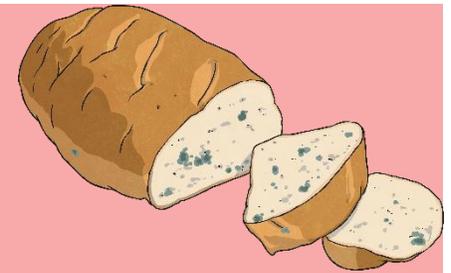
The influenza virus causes flu symptoms, such as a headache and fever.



Athlete's foot is caused by a fungus that grows between the toes.



Plaque on our teeth is formed when bacteria in the mouth combine with small food particles.



The fungi that grow on food are called moulds. Mould can make you ill if you eat it.

What Makes Mould Grow?

Mould is the name for the types of fungi that grow on food. What do you think makes mould grow?

It is useful to know what makes mould grow so that we can stop it happening as fast, and keep our food fresher for longer.

You are going to use the scientific method to create an investigation.



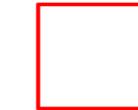
Hypothesis

Scientific Question: What are you going to find out?



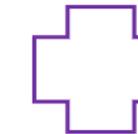
Prediction

What do you think will happen? Why?



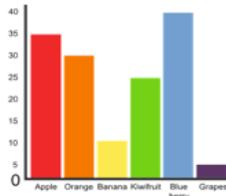
Equipment

What will you need to test your hypothesis?



Method (with a diagram)

How are you going to carry out your investigation?



Results

Time it, measure it, observe it. Record what you have found. Use a table, bar chart, line graph?



Conclusion

Look at your hypothesis, what have you discovered? Use your results to support your answer. How could you do it better next time? Did anything surprise you? Why?



What Makes Mould Grow?

For example, you may put one slice of bread in the light and one in the dark. Or one may go in the fridge and the other over a radiator. Or you may choose to dampen one slice of bread before putting it in the bag, while leaving the other dry.



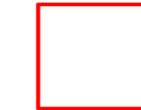
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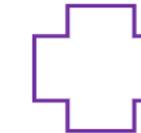
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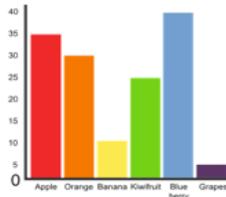
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Time it, measure it, observe it. Record what you have found. Use a table, bar chart, line graph?



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What Makes Mould Grow?

Set up your investigation.

Write out your method. Include all of the key parts into your method.

Today, you will need to:

- Create your question
- State your hypothesis (this is your prediction) (I think....)
- Record your procedure (these are your steps)
- Set up the experiment using 2 slices of bread and 2 plastic bags.
- Record your first observation on the next slide.



Hypothesis

Scientific Question: What are you going to find out?



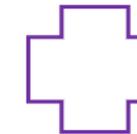
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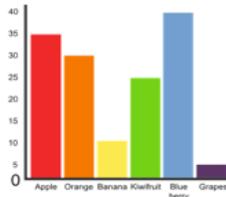
Equipment

What will you need to test your hypothesis?



Method (with a diagram)

How are you going to carry out your investigation?



Results

Time it, measure it, observe it. Record what you have found. Use a table, bar chart, line graph?



Conclusion

Look at your hypothesis, what have you discovered? Use your results to support your answer. How could you do it better next time? Did anything surprise you? Why?



Scientific Method: Observations.

Record your observations for the next week. Use drawings to support your description.

Day	Observation	Inference (what does that tell you)

Scientific Method: Observations.

Record your observations for the next week. Use drawings to support your description.

Day	Observation	Inference (what does that tell you)

Scientific Method: Observations.

Record your observations for the next week. Use drawings to support your description.

- Remember to record daily observations that describe what you see as well as a diagram to support your description.
- Record daily until our next science lesson.