

















Living Things and Their Habitats: More About Microorganisms

Aim: To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals by identifying the characteristics of microorganisms. I can identify the characteristics of different types of microorganisms.	Success Criteria: I can draw conclusions from my results. I can describe and compare the structure of different cells. I can describe the characteristics of different microorganisms. I can design a microorganism using these characteristics.	Resources: Lesson Pack Mould investigation equipment from last lesson Mould Investigation Activity Sheets from last lesson Playdough in different colours Petri dish per child
	Key/New Words: Microorganism, cell, eukaryote, nucleus, DNA, fungus, virus, bacteria.	Preparation: Conclusion Activity Sheet - 1 per child Make a Microorganism Activity Sheet - 1 per child

Prior Learning: The children will have learnt about different types of microorganisms in Lesson 4. They will have set up an investigation into the growth of mould in Lesson 4.

Learning Sequence

	Forming Conclusions: Children observe their slices of bread from the mould investigation set up in Lesson 4. Children complete the differentiated Conclusion Activity Sheet with their conclusion and answer to their question. Look for children who can use their observations to draw accurate conclusions about the growth of mould.  Children explain their conclusions and describe how they could use the results of their investigation to keep bread mould-free for longer.	
	Which Conditions Cause Mould to Grow? Children move around the classroom to talk to other pairs about their conclusions. Children complete the Conditions for Mould Growth section of their Conclusion Activity Sheet using the information they find out from their classmates.	
	Classifying Microorganisms: Explain how Microorganisms are classified using the diagram and information on the Lesson Presentation .	
	Different Cells: Use the Lesson Presentation to explain the main difference in the structure of the cells of different microorganisms, in particular fungi and bacteria.	
	Identifying Cells: Children talk to their partner about the cells shown on the Lesson Presentation , and attempt to identify which is a fungus cell and which is a bacterium cell. Look for children who can identify the structure and characteristics of the cells found in different microorganisms.	
	Make a Microorganism: Children use different colours of play dough to sculpt their own single-celled Microorganism in a petri dish. Children complete their differentiated Make a Microorganism Activity Sheet with the name of their Microorganism, its classification and its uses or effects. Look for children who are able to use the characteristics of the different cells to create their own microorganism, and who can describe its uses and effects.  Children refer to the key facts box on their activity sheet for information on the structure and classification of different cells.	
	What Do You Know About Microorganisms? Children share 3 things they have learnt about Microorganisms with a partner.	

Taskit

Displayit: Take photographs of the children's playdough microorganisms. Create a display to show off their creations, along with facts about each microorganism.

Makeit: Children make a poster to describe and explain ways to store food so that it remains mould-free for as long as possible.

Researchit: Children find out about fungi that live in their local area. Can they name and identify the species local to their school? Remind children about the dangers of touching or eating any fungi they find.



Science

Living Things and Their Habitats

The background is a vibrant green field filled with various stylized microorganisms. There are purple, rod-shaped bacteria, some with flagella. There are also clusters of red, spherical organisms, some resembling yeast or fungi. Several green, spiky structures with long, thin protrusions are scattered throughout, resembling viruses or certain types of algae. The overall style is colorful and illustrative.

More About Microorganisms



Aim

- I can identify the characteristics of different types of microorganisms.

Success Criteria

- I can draw conclusions from my results.
- I can describe and compare the structure of different cells.
- I can describe the characteristics of different microorganisms.
- I can design a microorganism using these characteristics.

Forming Conclusions



In the last lesson you set up an investigation to find out which conditions cause mould to grow.

You have been observing your slices of bread and recording your results.

Now it is time to use your results to form your conclusion.

Collect your slices of bread, ensuring that you do not open the sealed bags.



Forming Conclusions



Observe your slices of bread again, and look at your results table.

Do you notice anything about the different slices of bread? Did mould appear earlier on one of the slices? Is there more mould growing on one of the slices?

Think about what this tells you. Can you use your results to answer your question?

Complete the Mould Investigation Conclusions Activity Sheet with your ideas.

★ Conclusion

You have been gathering results to answer your question about the conditions in which mould grows. What question did you investigate?

Draw and describe the two slices of bread.

What do you notice about your results and your observations? Is there more mould on one of the slices? Did the mould grow faster on one slice?

Can you use your observations and results to answer your question?

Conditions for Mould Growth
Make a list in the space below of the different conditions that cause mould to grow.

Which Conditions Cause Mould to Grow?



Your investigation allowed you to test only one condition. For example, you may have found that mould grows well in damp conditions.

However, there are many more conditions that will cause mould to grow. Move around the classroom to talk to other pairs to find out what these conditions are.

Keep a record of what you find out on the Conditions for Mould Growth section of your activity sheet.

Classifying Microorganisms

Mould is a fungus, which is just one type of microorganism. All microorganisms share similarities and differences, and can be classified using the Linnaean taxonomic system.

Can you recall any of the levels of this classification system?



Classifying Microorganisms

All living things are initially grouped into 3 domains: archaea, bacteria and eukaryotes.

The living things in the archaea and bacteria domains are collectively known as the prokaryotes.

Fungi, plants and animals are all eukaryotic kingdoms. Eukaryotic microorganisms include mould and yeast, as well as microscopic animals and plants such as dust mites or plankton.

Bacteria are prokaryotic microorganisms.

Viruses are not classified using the standard classification system.

Domain

Kingdom

Phylum

Class

Order

Family

Genus

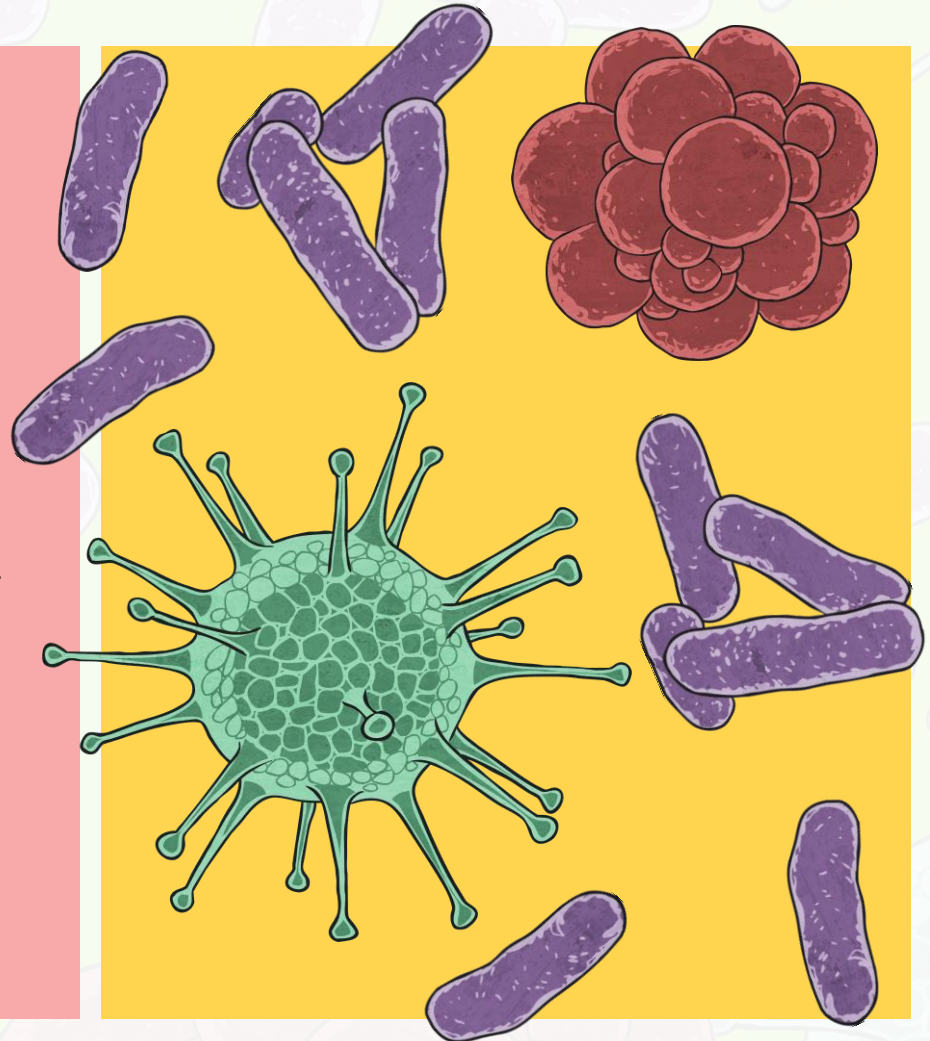
Species

Different Cells

What is the difference between eukaryotic microorganisms and prokaryotic microorganisms?

The main difference between the two types of organisms is the structure of their cells.

Cells are the building blocks of an organism. Many microorganisms are made of just one single cell. It may help you to think of cells as small compartments that contain the things needed to keep an organism alive.



Different Cells

Eukaryotic cells, such as the mould cells on your bread, contain smaller parts called organelles. A very important organelle in eukaryote cells is the nucleus. It acts as the control centre of the cell and includes all the genetic information of the cell, which is known as its DNA. The DNA is organised inside the nucleus.

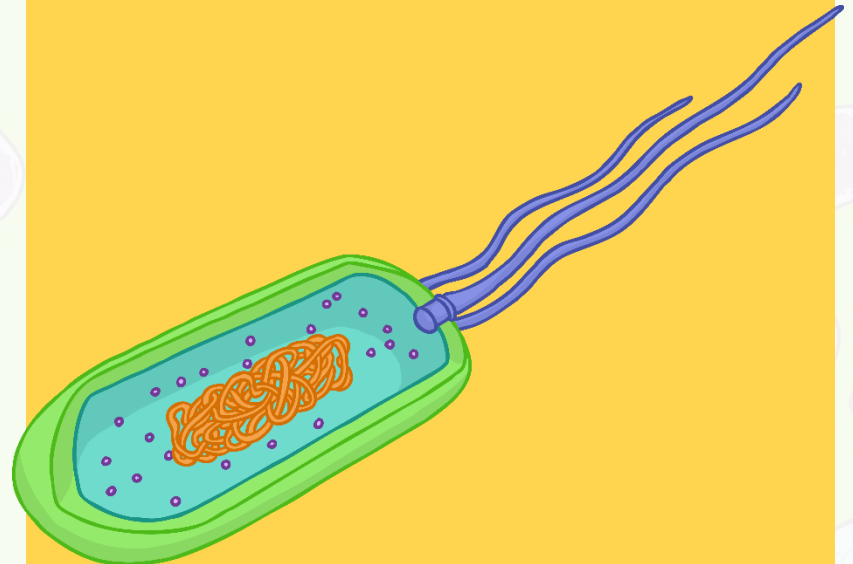
Prokaryotic cells such as bacteria do not usually contain any organelles. They do not have a nucleus and their DNA is not organised or contained within any structure in the cell.



Identifying Cells



Look at these diagrams of two different cells. Talk to your partner about which one is a fungus cell and which one is a bacterium cell. Can you explain your ideas?



Make a Microorganism

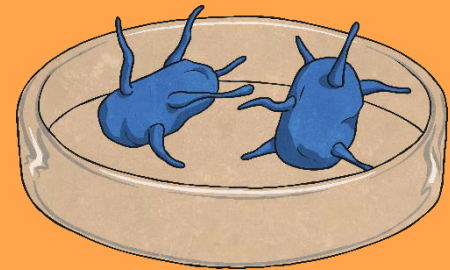
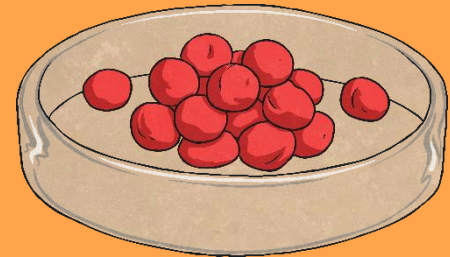
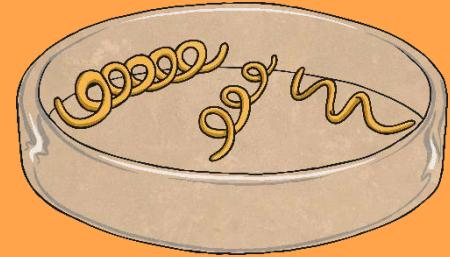


Can you use playdough to design your own single-celled microorganism? Use your petri dish to hold your sculpted cell.

Think about which type of microorganism it will be. Will it be eukaryotic (fungi, animals and plants) or prokaryotic (bacteria)?

Perhaps it will be a fungus, with a nucleus containing its DNA. Or maybe it will be a bacterium, with its DNA free within the cell.

Complete your Make a Microorganism Activity Sheet with the name of your microorganism, its classification and any other information including its uses or effects.



What Do You Know About Microorganisms?



What have you learnt about microorganisms? Tell your partner 3 things you have learnt, including:

1 thing about different types of microorganisms;

1 thing about the uses of microorganisms;

1 thing about the harmful effects of microorganisms.

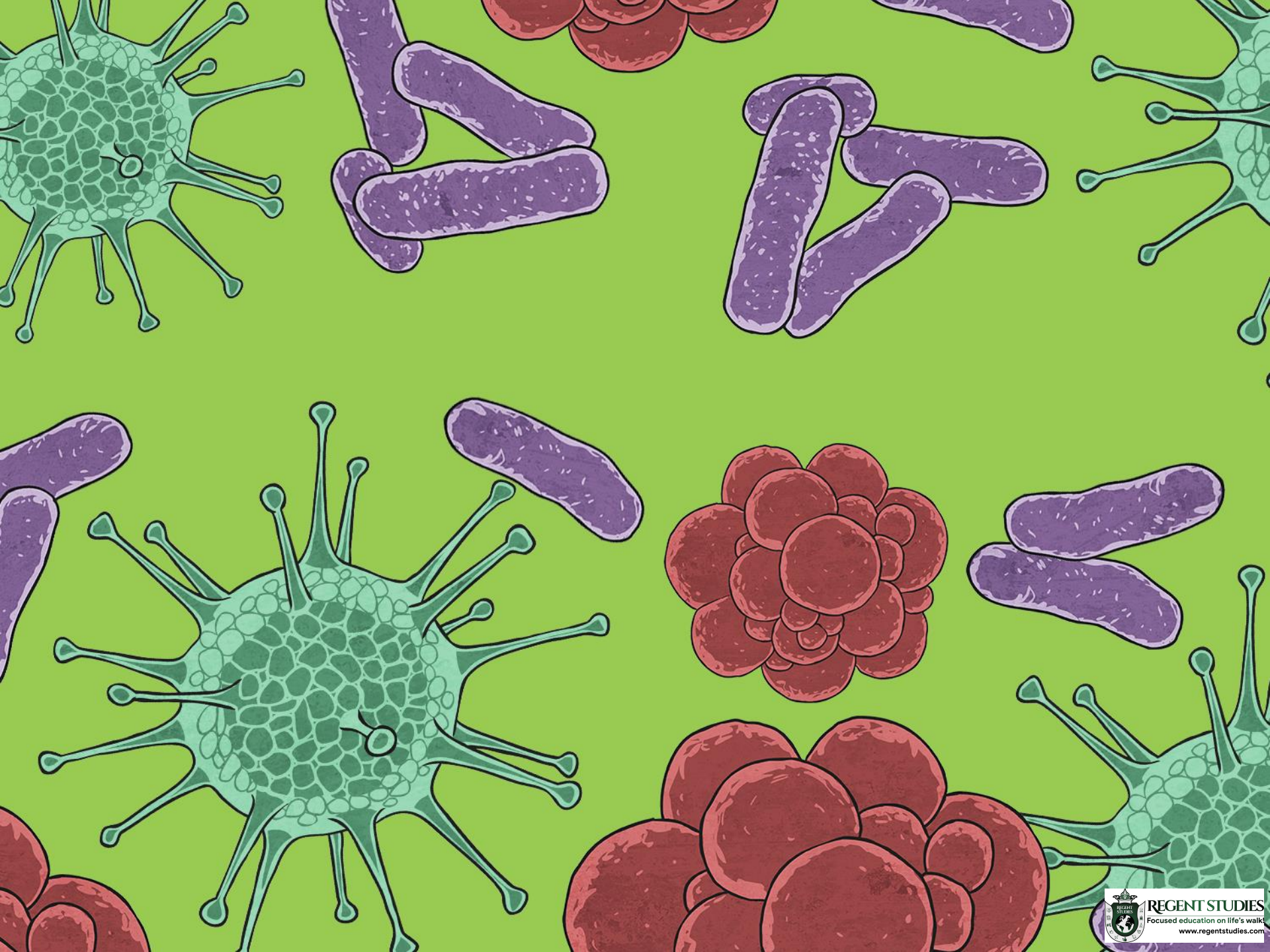
Aim



- I can identify the characteristics of different types of microorganisms.

Success Criteria

- I can draw conclusions from my results.
- I can describe and compare the structure of different cells.
- I can describe the characteristics of different microorganisms.
- I can design a microorganism using these characteristics.





Conclusion

You have been gathering results to answer your question about the conditions in which mould grows.

What question did you investigate?

Draw and describe the two slices of bread.

What do you notice about your results and your observations? Is there more mould on one of the slices? Did the mould grow faster on one slice?

Can you use your observations and results to answer your question?

Conditions for Mould Growth

Make a list in the space below of the different conditions that cause mould to grow.



Conclusion

You have been gathering results to answer your question about the conditions in which mould grows.

What question did you investigate?

Draw and describe the two slices of bread.

What do you notice about your results and your observations?

Can you use your observations and results to answer your question?

Why do you think the mould grew better in this condition?

Conditions for Mould Growth

Make a list in the space below of the different conditions that cause mould to grow.

What do you notice about your results and your observations?



Make a Microorganism

Name of microorganism _____

Draw a picture or stick a photo of your microorganism here.

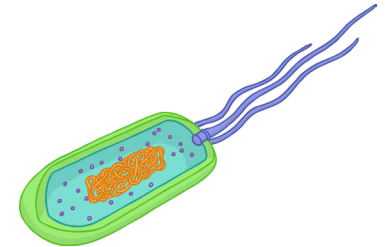
Classification of your microorganism (think about the structure of its cell. Is it a bacteria, an animal, a plant or a fungus?):

Is your microorganism useful or harmful to humans? What are its uses or effects?

Remember: fungus, plant and animal cells contain small organelles, including a nucleus containing organised DNA.



Bacteria cells do not contain a nucleus, and the DNA is free within the cell.





Make a Microorganism

Name of microorganism _____

Draw a picture or stick a photo of your microorganism here.

Classification of your microorganism (think about the structure of its cell. Is it a bacteria, an animal, a plant or a fungus?):

Is your microorganism useful or harmful to humans? What are its uses or effects?
