Let's use the Internet to learn more about flu.

1 **In pairs, use the internet link and complete one of the tables.**

TABLE A	
1 Type of disease	
2 Caused by	
3 People at a higher risk	_____ women. Children younger than _____ . People over _____ . People with _____ conditions.
4 Symptoms	

TABLE B	
5 Vaccination/Shot	The flu vaccine can be an _____ (injected through the skin) or a _____ (sprayed into the nostrils). It will help _____ you from getting the _____ .
6 How flu spreads	This virus travels in tiny _____ _____ from an infected person's _____ and _____ when he or she _____ or _____ . You can also catch the flu if those droplets get on your _____ and touch your _____ or _____ .
7 Steps to feel better	Rest in _____ or on the _____ . Drink lots of liquids/fluids like _____ or _____ . Take the _____ your are given.

2 **Work with another pair. Share the information and complete the other table.**

3 **Now read and write T (True) or F (False).**

a Flu is caused by a virus. ☐

b Drinking liquids is good for you when you have flu. ☐

c You have to touch a person who has got flu to catch it. ☐

d Flu is an infectious disease. ☐

e The flu vaccine is always an injection. ☐

f If you cover your mouth when you sneeze, you can help prevent spreading flu. ☐

g If you have a temperature/fever, you have flu. ☐

h If you have a bad headache, you may have flu. ☐

i It is a good idea for people over 65 to be vaccinated against flu. ☐

WE HAVE LEARNED THAT...

Flu is caused by a _____ . The most common symptoms are _____ , chills, _____ , body aches and headaches. People who are at a _____ risk, like _____ children, pregnant women and people over _____ can have a _____ to prevent them from catching the flu. You can catch the _____ from a person who is already _____ , if he or she sneezes, coughs or laughs. You can also catch flu if those germs get on your _____ and you touch your _____ or nose.

Scientists discovered that flu is caused by a virus. Some scientists think that viruses are microorganisms. Have you ever seen a virus?

1 **Find the meaning of these words and write it down.**

Microwaves _____ .

Microclimate _____ .

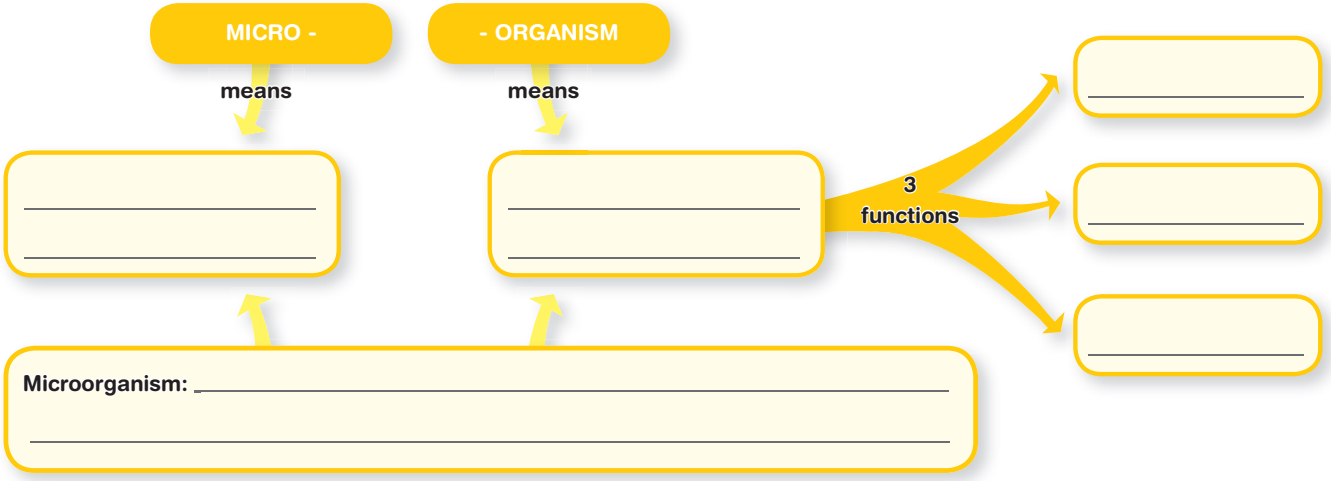
Macronutrient _____ .

Macrocephalic _____ .

Micrometre _____ .

Macro means _____ . Micro means _____ .

2 **Look at the word 'microorganism'. Explain its meaning.**



3 **Watch the animation. Order the elements by size from smaller to bigger. Circle the microorganisms.**

yeast dust mite pollen red blood cells* ebola virus
human hair white blood cells (lymphocyte) staphiloccocus bacteria

1 _____ 5 _____

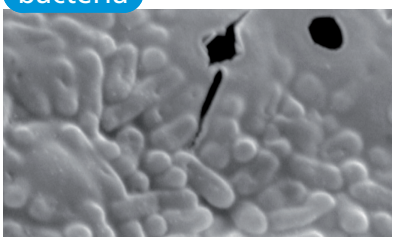
2 _____ 6 _____

3 _____ 7 _____

4 _____ 8 _____

4 **Look at the pictures. Are they microorganisms? Justify your answers.**

bacteria



YES. It is a microorganism because _____

_____

mosquito

NO. It is not a microorganism because _____

_____

green algae

_____

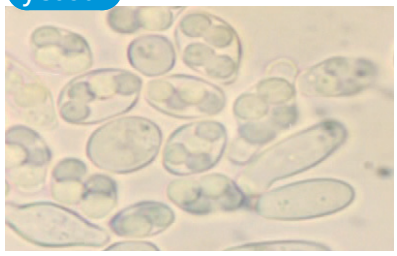
_____

dust

_____

_____

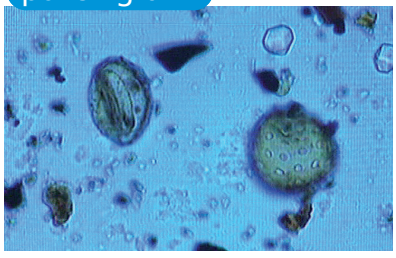
yeast



_____

_____

pollen grain



_____

_____

bee hummingbird

_____

_____

sea weed

_____

_____

WE HAVE LEARNED THAT...

A microorganism is a _____ _____ which cannot be seen by the _____ _____ . Some examples of microorganisms are _____ , _____ and _____.

WWW THE CELL

We know that 'micro' means very small. Let's learn more about micro 'objects'.

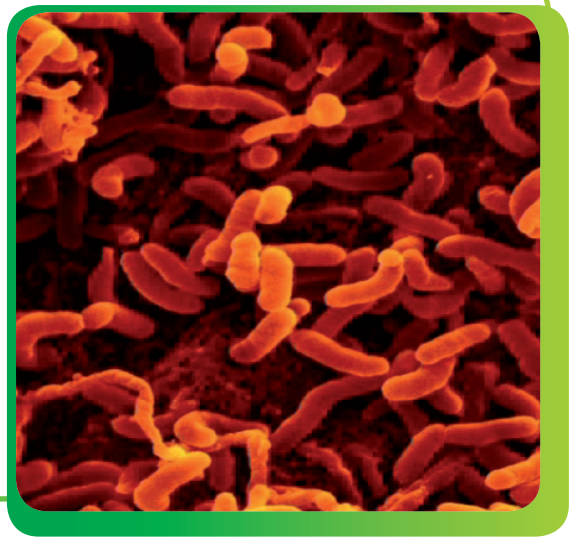
1 **Read the texts and write the titles.**

AMOEBAS BACTERIA YEASTS VIRUSES GREEN ALGAE

A

They are unicellular organisms and can reproduce very fast. They can live in lots of habitats. Most of them can grow* on non-living surfaces like soil*, air or water. Some live in or on the surface of animals and plants. They vary in size and are usually found in enormous numbers. Some carry out photosynthesis.

Many of them are useful and help recycle organic waste* or help processes like the fermentation of milk. Some are harmful and cause diseases like strep throat, which can be treated with antibiotics*.



B

They are smaller than a cell. They are parasites: they need to invade a cell to live, that is, a living host* like a plant or animal or even bacterial cells. Viruses use host cells to reproduce because they can't reproduce on their own. Most of them cannot survive* long outside a living host.

They are always harmful and cause diseases. Antibiotics cannot kill them but we can prevent infection using vaccines.

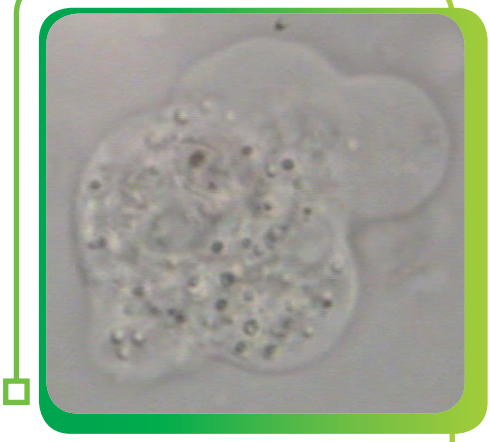
Some scientists consider them to be living things, while others do not.

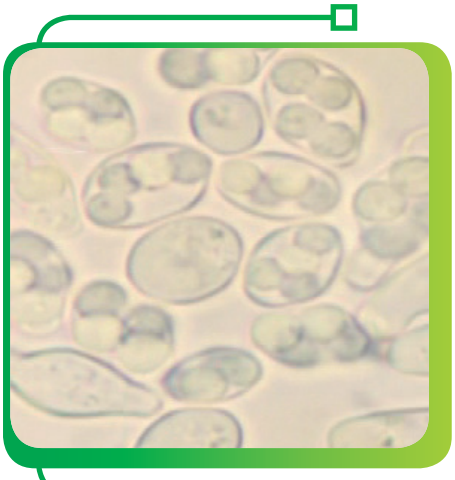
C

They are unicellular and do not have a fixed shape. They live in fresh water, seas, in wet soil and in animals (including people).

They reproduce fast. They divide into two or three new cells.

They are predators and eat other microorganisms. To eat they elongate their bodies to cover their food and absorb it. They can be harmful. They can carry diseases. Some of them can live in contaminated food. However, they are also helpful because they are part of a food chain.





D

These unicellular microorganisms are used by human beings to make bread, beer or wine. Mixing them with different sugars in certain conditions creates the process of fermentation. In this process, sugars present in wheat or barley, for example, are transformed into carbon dioxide and alcohol. It seems that Egyptians started using this process 5,000 years ago.

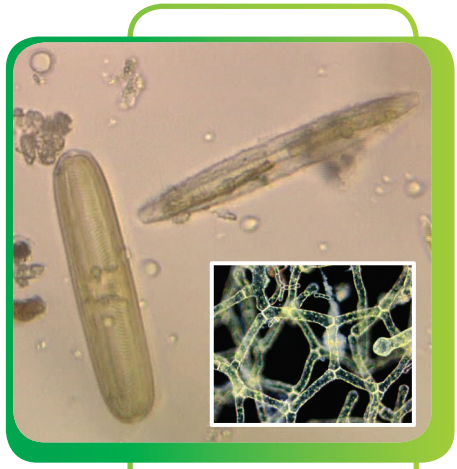
They are considered fungi, like moulds (responsible for bread decay) and mushrooms. They can reproduce on their own.

E

These are unicellular and green. They are called producers because they carry out photosynthesis but they are not 'true' plants. Through photosynthesis they produce oxygen that other organisms will use. They can reproduce on their own.

They are a source* of energy for marine ecosystems*.

They can be visible when they are grouped in large quantities and form 'algal blooms'. Algal blooms can be harmful and break the cycle of life* in lakes and seas because they can limit the quantity of light for plants, animals and other microorganisms in the ecosystem.



2 **Complete the table with the information in the texts. Tick the boxes.**

CHARACTERISTICS	BACTERIA	VIRUSES	YEASTS	AMOEBAS	GREEN ALGAE
They are too small to be seen by the naked eye.					
They are smaller than cells.					
They are unicellular organisms.					
They can perform the functions of all living things.					
They carry out photosynthesis to produce oxygen.					
They help in the process called fermentation.					
Scientists do not agree on whether they are living or non-living things.					
They are always harmful.					
They contribute to the life cycle* of ecosystems.					
Antibiotics can kill them.					

3 **Do you think viruses are microorganisms? Discuss and justify your answer.**

We think that viruses are _____ because _____

_____

WE HAVE LEARNED THAT...

Viruses and _____ are too _____ to be seen by the naked eye.

Microorganisms such as _____ , _____ and _____

perform the three functions: _____ , _____ and reproduction; but

viruses perform only _____ .

Viruses reproduce when they infect other _____ .

Microorganisms also contribute to the life cycle of ecosystems.

Think about the initial questions. Any ideas so far?

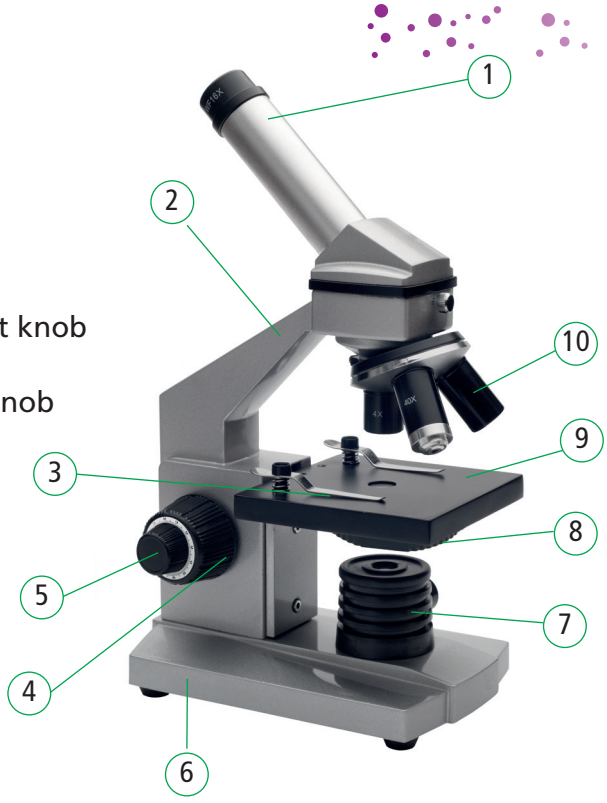
4 TOO SMALL TO SEE?

To observe microorganisms, scientists need powerful tools like electron microscopes or digital microscopes. Schools have simple microscopes like optical microscopes or stereo microscopes. Have you ever used a microscope?

1 **Play a game!**

2 **Write the correct numbers to label the microscope.**

- ☐ eyepiece/ocular lens
- ☐ objective lenses
- ☐ stage clips
- ☐ stage
- ☐ light source
- ☐ base
- ☐ diaphragm
- ☐ coarse adjustment knob
- ☐ fine adjustment knob
- ☐ arm



3 **Let's use a microscope:**

Pond water microorganisms.

- Collect some water from a pond or puddle.
- List the materials you will need.
- Before starting to look at the sample, do you know how to use a microscope?
- Now watch the video to learn more about pond water microorganisms.

SOME MICROSCOPE INSTRUCTIONS

1) Start with the microscope on the **low* power objective lens** position.
2) Put the sample* to be observed on the **slide** and cover it with a **cover slip**. Place it on the **stage** and fix it with the **stage clips**.
3) Switch on the **light source** and open the **diaphragm** to let light pass through.
4) To change to the **high* power objective lens**:
   1 Focus and centre the sample on the stage.
   2 When changing objective lenses WATCH FROM THE SIDE; be careful and STOP if you think the lens can touch the slide!
5) When using the **high power objective lens**, use the **fine adjustment knob** to obtain a clear image of the sample.
6) Before you remove the slide, put the microscope back on the **low power objective lens.**

4 **Observe the sample. First by the naked eye, then with the hand lens and finally use the stereo microscope. Draw what you see.**

NAKED EYE	HAND LENS	STEREO MICROSCOPE

5 **Observe your sample with the optical microscope. Draw what your sample looks like using a low, a medium and a high* power objective lens.**

LOW	MEDIUM	HIGH
Magnification: _____ X _____ = _____	Magnification: _____ X _____ = _____	Magnification: _____ X _____ = _____

TOTAL MAGNIFICATION = Ocular lens power x objective lens power

6 **How does the view of the sample change using different lenses? Write your answer.**

- The field of view. _____
- The image of the sample. _____

7 **Why are microscopes so useful? Complete the text.**

combination of lenses living things or objects lenses
magnified images instruments the naked eye

Microscopes are _____ used to observe _____ that cannot be seen by _____ .

This optical instrument uses _____ or a _____ to produce _____ of small living things or objects.

WE HAVE LEARNED THAT...

Microscopes are used to _____ _____ .

Before using a microscope you need to:

- Start with the microscope on the _____ position.
- Put the sample on the _____ and cover it with a _____ . Then fix it with the _____ _____ .
- Use the _____ and open the _____ until you have enough light to do the observation.
- To change to the _____ power objective lens:

  1 _____ and _____ the sample on the stage.

  2 _____ and _____ if you think the lens can touch the slide.

  3 Use the _____ to obtain a _____ image of the sample.

  4 Finally, place the microscope back on the _____ power objective lens.

Now you know how to use a microscope and that microscopes help us to study microorganisms. Let's find out more about a microorganism: mould on bread.

WHAT WE WANT TO FIND OUT

What environmental conditions make mould grow on bread?

STEP 1: ORGANISE YOUR WORK

1 **In groups of four, plan your investigation.**

- Use three pieces of sliced white bread. All samples of bread should be equal. The same kind and size should be used in all experiments.
- Decide which variable your group is going to choose and write down the conditions for each sample. Variables in the investigation are:

LIGHT: no light at all / some light / direct light

HUMIDITY: dry / damp / wet

TEMPERATURE: cool / warm / hot place

- Focus on one variable and keep the other variables constant.

VARIABLE	

SAMPLES	CONDITIONS
Bread A	
Bread B	
Bread C	

2 **Decide on a role for each person.**

ROLE	NAMES and TASKS
The optical microscope user	_____ will be in charge of supervising the use of the optical microscope.
The stereo microscope and hand lens user	_____ will be in charge of supervising the use of the stereo microscope and hand lens.
The photographer / illustrator	_____ will be in charge of taking the photos or drawing pictures to illustrate the investigation.
The editor	_____ will write down the results, complete the graphs, etc. with the help of all members of the group.
All members of the group	They will make daily observations.

3 **Think of all the materials you need for your investigation and write them down.**

WE NEED

_____

_____

_____

_____

STEP 2: MAKE A HYPOTHESIS

4 **In which conditions do you think mould will grow more quickly? Justify your answer.**

WE THINK THAT MOULD WILL GROW MORE QUICKLY _____

_____

STEP 3: INVESTIGATE

5 **Decide how you are going to carry out your investigation. Justify your answers.**

1 **To make sure our investigation is a fair test we are keeping these variables constant:**

_____

_____

_____

2 **Variables - we are only working with one variable:**

_____

_____

3 **The method used in our investigation:**

First we will _____ .

Then we will _____

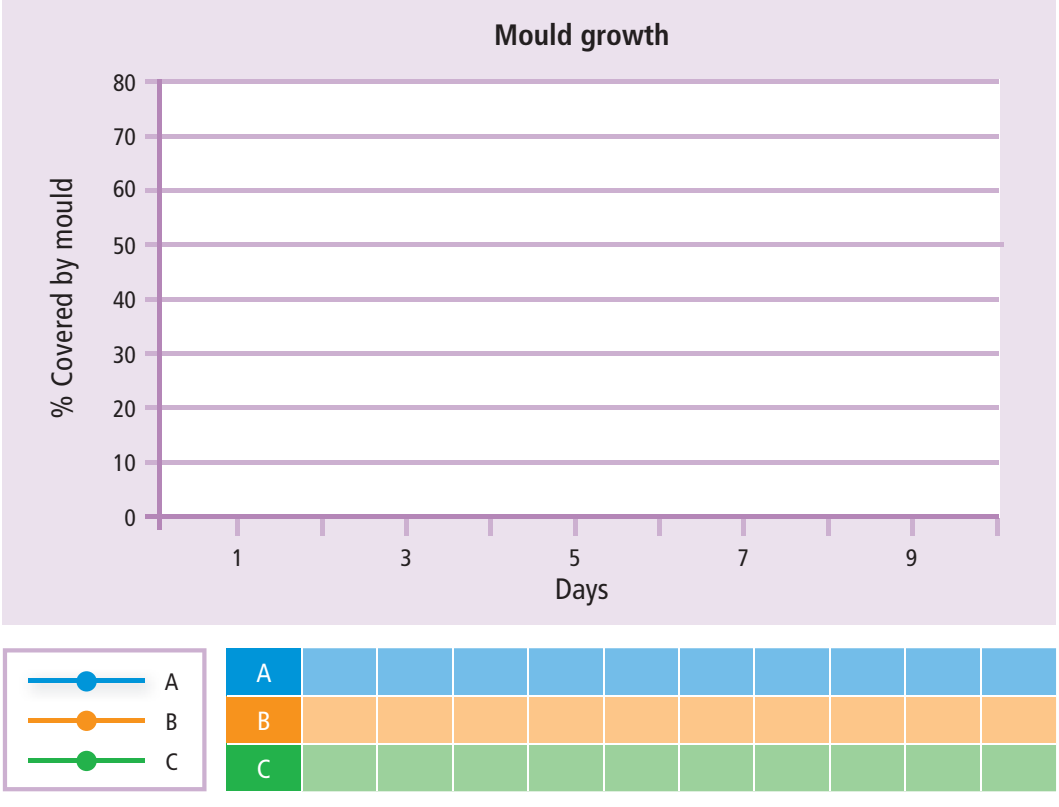
_____ .

Finally _____ .

6 Check your samples periodically. Observe them using the hand lens, the stereo microscope and the optical microscope. Collect the data: draw or take a picture of the sample. Describe it.

Date	Sample A	pictures	Sample B	pictures	Sample C	pictures
Day 1	description		description		description	
Day3						
Day 5						
Day 7						
Day 9						

7 Make a linear graph with the collected data. Give the results in percentages (%).



STEP 4: CHECK YOUR PREDICTIONS

8 **Write down the results from your investigation. Then circle the right option in bold.**

After collecting the data from the investigation, we found out that _____

_____

_____

The investigation results **confirm / do not confirm** our prediction.

9 **Present the results of your investigation. Prepare an oral presentation about your investigation. Use the following sentences.**

LANGUAGE HELP

- We wanted to find out ...
- The variable studied in the investigation was …
- Our prediction was …
- We used …
- The samples were …
- The data gathered during the investigation shows that …
- Our conclusions are …

STEP 5: CONCLUSIONS

10 **Draw some conclusions in relation to the initial question.**

WHAT WE WANT TO FIND OUT

What environmental conditions make mould grow on bread?

ANSWER

The investigation and collected data on the variable _____ show evidence that

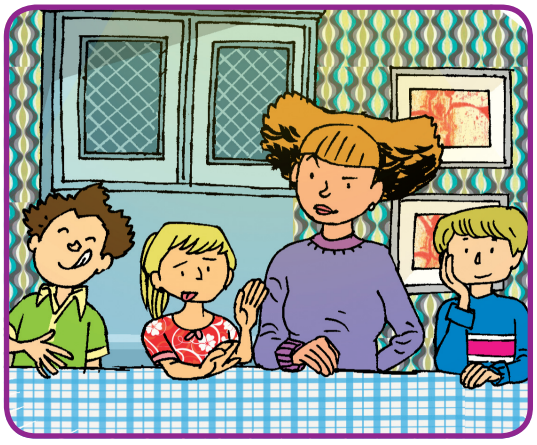
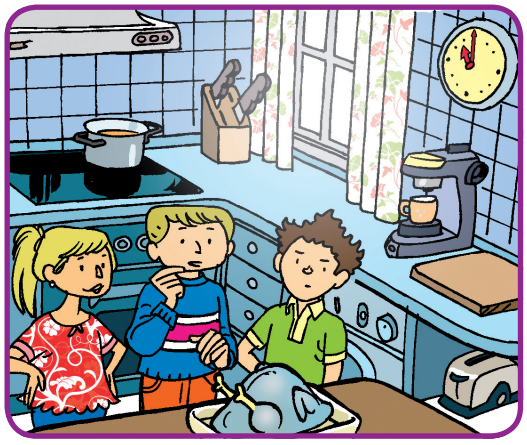
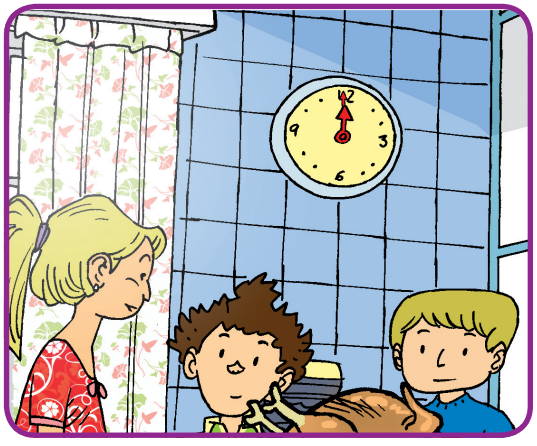
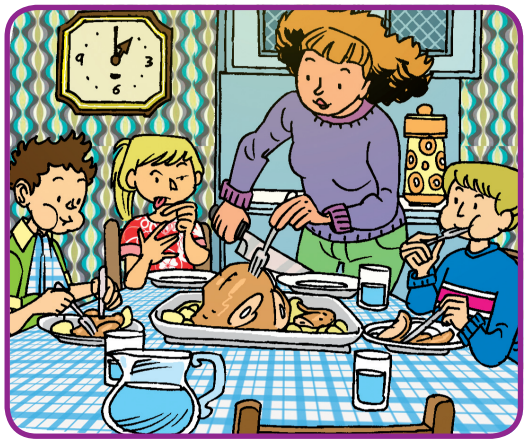
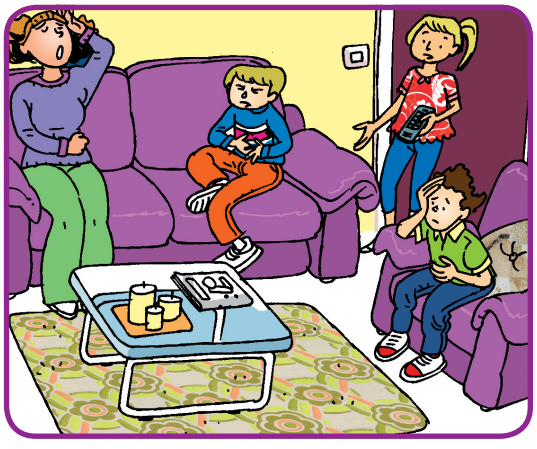
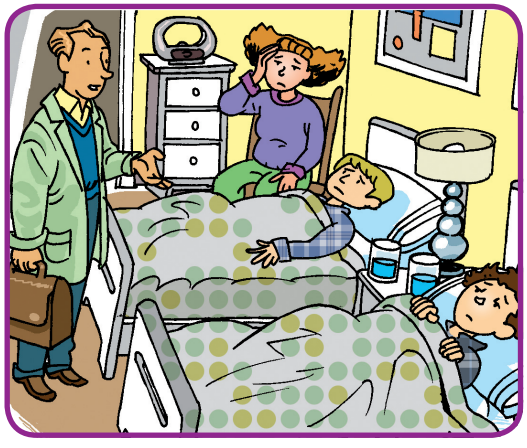
_____

_____

6 KEEP AWAY FROM HARMFUL MICROORGANISMS!

Microorganisms are very important for living things and they are good for us. However, some microorganisms are bad for us and can cause serious illness* or infection.

1 **Look at the comic story.**

2 **Now answer the questions. Discuss with your partner.**

You should know that …

- Salmonella is a bacteria often found in chicken or eggs. It is a type of food poisoning.
- Eating food contaminated with salmonella causes gastroenteritis (inflammation of the stomach and intestines, producing diarrhoea).
- To kill the salmonella bacteria, you must cook the contaminated food properly.

1 What food was contaminated? _____

2 How do you know? _____

3 Why did the food make them ill?

_____

_____

4 Does freezing* kill salmonella? _____

5 What should they have done to cook the chicken well and avoid salmonella poisoning?

_____

_____

WWW HOW INTERESTING!

Fresh milk goes off very quickly but pasteurised milk can last longer.
Where do you think the word 'pasteurisation' comes from?

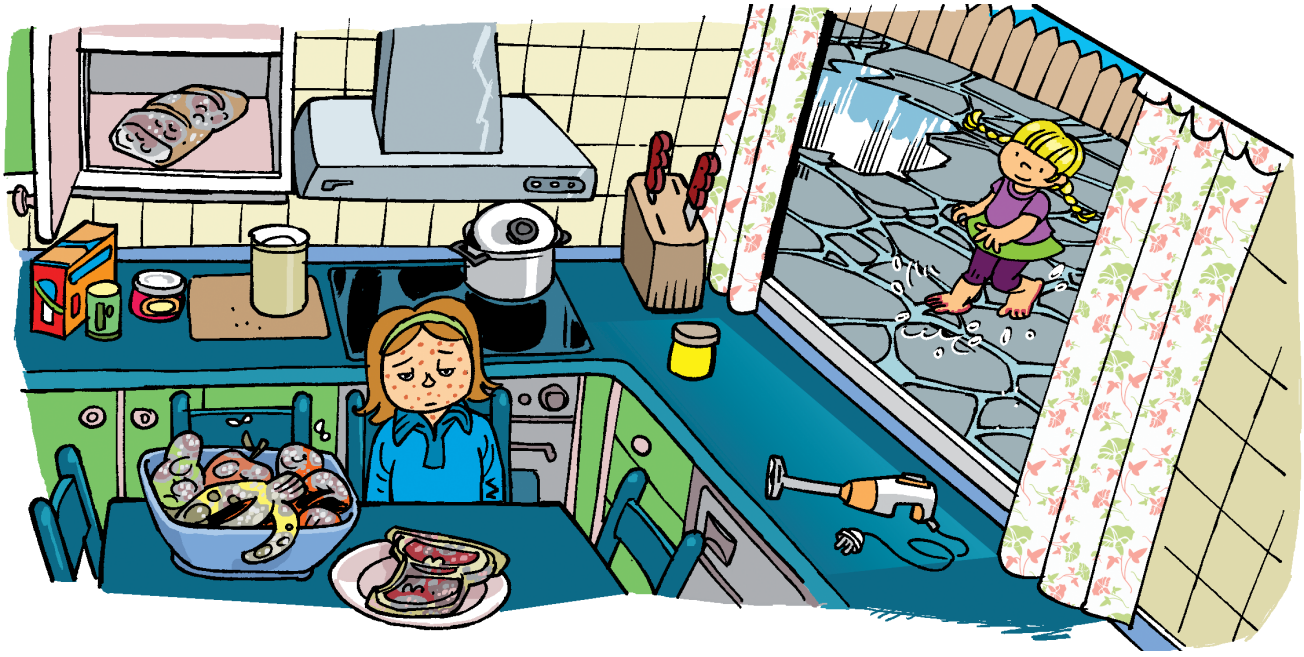
WWW AT THE DENTIST

WE HAVE LEARNED THAT…

High temperatures will destroy the _____ that causes salmonella but freezing won't. It is important to cook food properly to avoid _____ (food poisoning).

We have seen some examples of harmful microorganisms, but there are a lot more.

1 Circle five places where you can find the effects of harmful microorganisms.



2 Read and write the titles. Complete the texts.

Tooth decay Flu Algal bloom Fruit decay Malaria
Athlete's foot Chicken pox Food poisoning

_____

It is caused by _____ . To avoid it, keep food in a cool place.

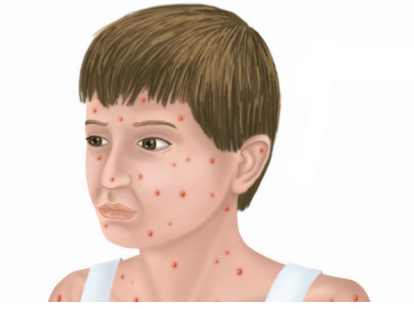
_____

Viruses _____ our body and cause _____ . A _____ temperature is our body's natural response to the attack.

_____ like damp places. As a result, _____ can be transmitted in wet areas if we walk barefoot.

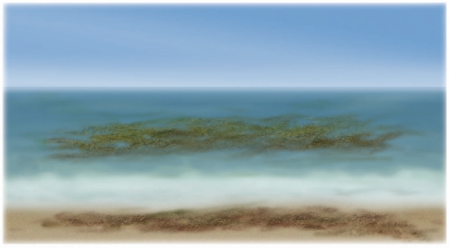
It is caused by _____ .
It produces cavities in teeth also called dental caries.

_____ spores on fruit cause _____ . _____ is a kind of white-greenish _____ .



It is a very contagious illness caused by a _____ . It causes a red, itchy skin rash.

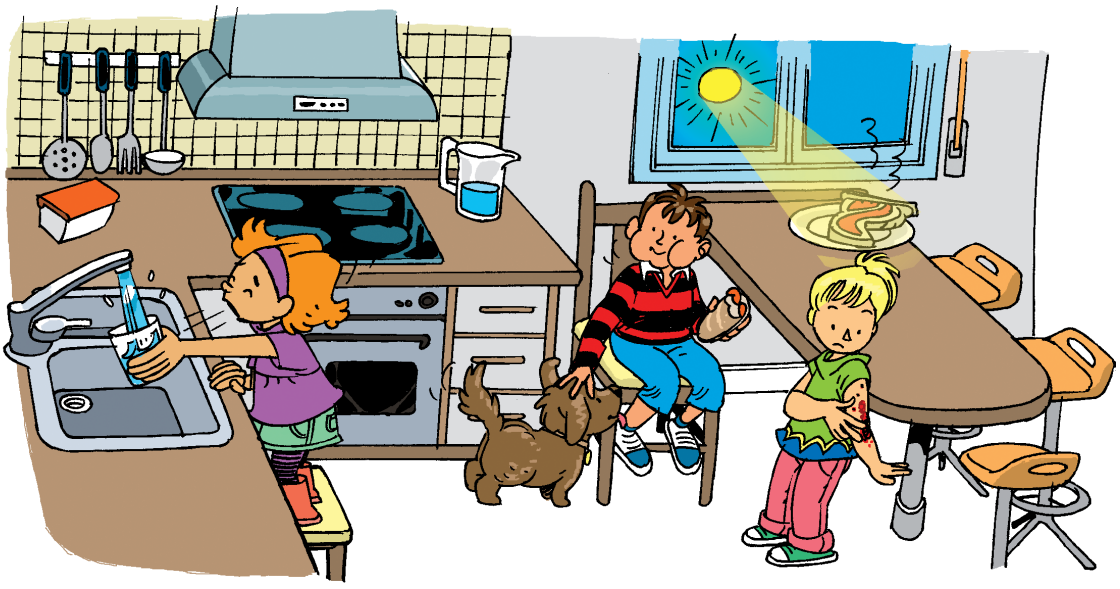
It is a disease caused by _____ , usually transmitted by a _____ in tropical countries. It affects the liver and blood.



Sometimes _____ start growing and reproducing fast in lakes or the sea. This limits the quantity of _____ for other plants or animals living in the same _____ .

3 **Listen and check your answers.**

4 **Circle four examples of bad hygiene and write down what you should do instead.**



We should _____

_____

_____

_____

_____

WE HAVE LEARNED THAT...

Some microorganisms are _____ and _____ for our health.

For example:

- Viruses produce infectious diseases like _____ or _____ .
- Some bacteria cause _____ decay or _____ poisoning.
- Some harmful _____ cause athlete's foot or _____ on fruit or bread.
- Some protozoa cause diseases like _____ .

Good personal hygiene can prevent _____ from _____ microorganisms.

Some microorganisms are important for other living things and can be good for us.

1 **Read the information and answer the questions.**

ACTIVELIFE yoghurt

New Formula

Nutrients composition	Unit / 115 g	100 g
Energy (Kcal)	109	95
Proteins (g)	5.2	4.5
Carbohydrates	14.6	12.7
Fat	3	2.6
Calcium (mg)	181	157
Vitamin E (mg)	2.07	1.8
Vitamin B6 (mg)	0.23	0.21
Vitamin D (µg)	0.86	0.75

Sugar fermented milk
Ingredients:
Pasteurised skimmed milk
Cream
Sugar (6.7%)
Glucose
Stabilizers
Milk enzymes
Lactobacillus casein

It helps to increase the intestinal flora and to improve the intestinal activity.

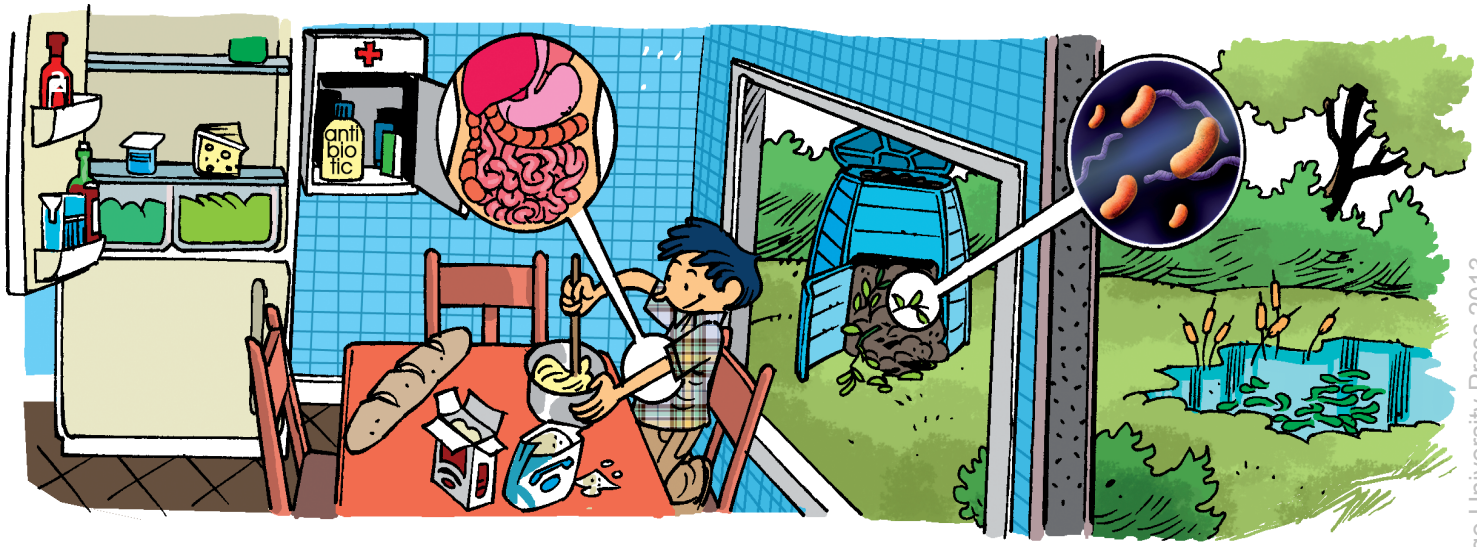
- Which of the ingredients in yoghurt do you think is a microorganism?

  a pasteurised skimmed milk **b** cream **c** sugar **d** lactobacillus casein

- Do you think that yoghurt is healthy*? Justify your answer.

---

2 **Circle seven places where you can find microorganisms that are helpful.**



3 **Read and write the titles. Complete the texts.**

Composting Baking and brewing Cheese and yoghurt Algae
Vaccinations Sewage treatment Intestinal flora Penicillin

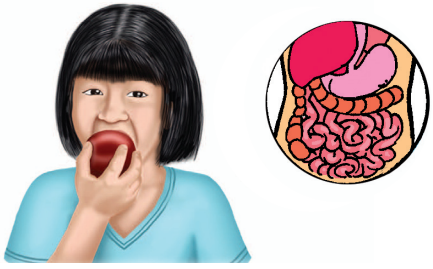
_____

It is used to treat some _____ .
It is a group of antibiotics that comes from
_____ .

_____

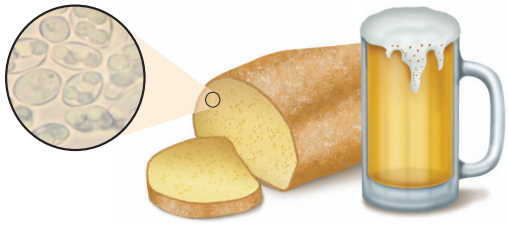
To make _____ and
_____ we need
_____ .

_____



Some _____ live in our intestines and
help the _____ activity.

_____



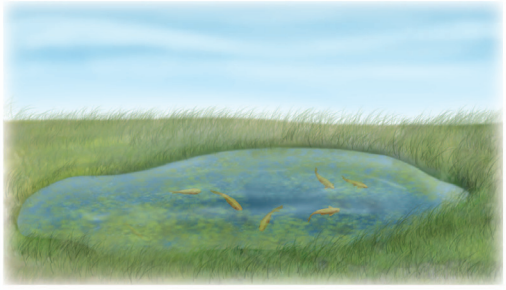
We need this microorganism to produce
_____ and beer. _____ is a
_____ .

_____

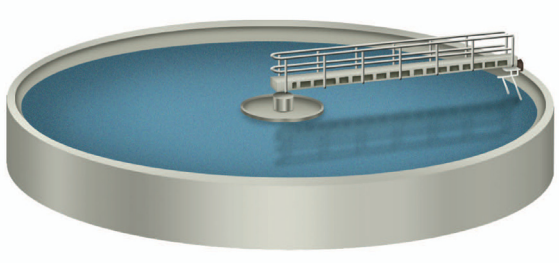
_____ help decompose _____ material.
They fix _____ in the soil and return it to the
atmosphere in its _____ form.

_____

_____ prevent diseases. They are often
made from dead or weakened forms of the
_____ or its inactive toxins.



They _____ in water and help to produce _____ and _____ nutrients.



A _____ called 'paramecium' removes harmful _____ from sewage by eating them! Then it is safe to release sewage into the _____ .

4 **Listen and check your answers.**

WE HAVE LEARNED THAT...

Some helpful microorganisms are _____ and others are _____ for our health.

Some useful bacteria can help:

- in our _____ activity.
- to make _____ and _____ .
- to _____ organic matter.
- to fix _____ in the soil.
- to return nitrogen to the _____ .

We also need fungi:

- yeast: in the production of _____ or _____ .
- mould: to make _____ , a type of antibiotic.

Algae are important in producing oxygen and _____ nutrients.

Protozoa help in _____ treatment plants.

Scientists use dead or _____ forms of microorganisms to make _____ .

Vaccination is a preventive measure which reduces the risk of _____ .