

# Micro-Organisms

Micro-organisms (or microbes) are single-celled organisms that are found everywhere, but we can't see them. Some of them make us sick, but we can't live without them.

Most of us think that microbes are harmful and cause disease, but in fact, microbes do us more good than harm and only a few of them are bad for us. (The disease-causing microbes are called pathogenic microbes. Less than 5% of microbes are harmful!)

So, when someone asks "Did you wash your hands?" They are really asking, so did you get rid of germs that could make you and other people sick?!

Microbes were the first forms of life on Earth. They are essential for our existence as they form an important part of the Food Chain.

Microbes also help make a lot of the food that we enjoy eating e.g when eating a hamburger:

- \*fungi and bacteria help to make cheese
- \*yeast helps to make the bun

Lets explore the different kinds of microbes and find out more about them

## Viruses

\*Viruses are different to everything else found on this Earth.

\*They are very tiny and cannot be classified as dead or alive because they look more like crystals when they are outside cells, yet somehow come to life once inside a cell and take over the processes of the cell. Viruses are therefore strictly parasites. (That is, they cannot live outside a host and the host provides all the materials that the virus needs to survive, grow and multiply.

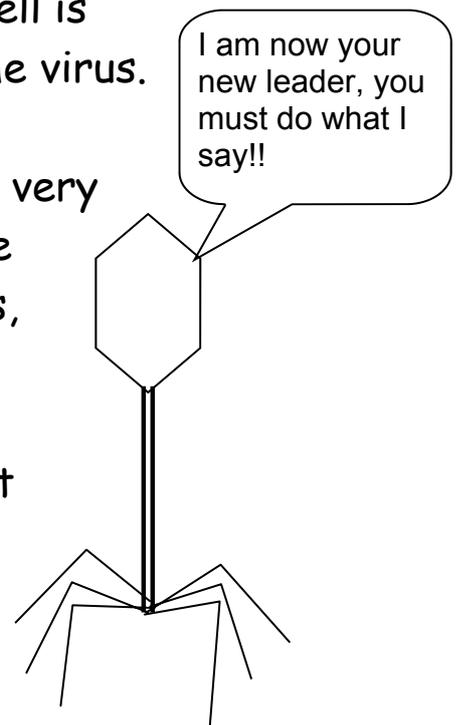
The average virus has a really boring life! In fact, all it has to do is to duplicate itself and create more viruses.

Viruses are really tiny packages of genetic material without a living cell surrounding it. To reproduce it joins to a living cell's command centre. Now, instead of producing substances the cell needs to survive, the cell is now forced to follow the instructions of the virus.

Because viruses are so simple, they change very quickly. This is why it is so difficult to cure illnesses caused by viruses (such as Herpes, cold-sores, warts, colds, 'flu, AIDs)

There are no medicines to cure viruses, but there are some medicines that help to relieve the symptoms.

Vaccines are injections that make our immune system strong. Our immune system can fight viruses. But you have to have the vaccine before you catch the virus!



# Fungi

\*The most common fungi are mushrooms, moulds and yeast.  
Fungi are different to other plants because they do not contain chlorophyll and cannot make their own food. Instead, they get their food (or nutrients) from organic matter such as decaying leaves, dead animal, bread, fruit etc. They mostly live off dead matter and are therefore very important in helping to decay old food and organic material

Fungi reproduce by either budding, or by releasing spores. And never by seed.

Moulds:

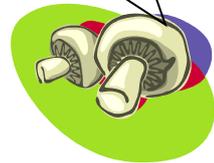
These are colonies of millions of tiny fungal cells that grow in one place



Mushrooms:

These are large spore heads of one kind of fungus (but most fungi are very small)

Did you call me Spore Head?



Yeast:

These are single-celled organisms that look a little like bacteria.

Can't they be quiet ... I'm busy budding!



## Good uses of Fungi:

1. We eat them for food (mushrooms) - yum!
2. They help make some cheese (e.g Camembert and Roquefort)
3. Fungi and bacteria produce penicillin and tetracycline. These are important medicines
3. Help with decomposition (rotting)

## Diseases by Fungi:

1. Athlete's foot
2. Ringworm
3. Thrush (fungi that grow in the mouth or mucous membranes)

## Fungi .....

### Yeast

Yeast is a type of fungus because it does not contain chlorophyll and gets its food from organic matter.

Yeast is particularly useful for people because it helps make some important food.

Yeast has been used for many many years to make wine and bread. Today, yeast is used in many fermentation processes.

Yeast is a source of Vitamin B, it helps make various antibiotics and hormones and is also used for food.

Yeast grows on food to ferment it and produces carbon dioxide and alcohol.

(Sometimes we evaporate the alcohol away, and sometimes we keep it!)

Yeast + sugar → alcohol + carbon dioxide

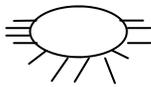
# Bacteria

Bacteria are a large group of small, unicellular organisms that lack a nucleus. (In other words, bacteria are true cells but they do not have a nucleus.) They live almost everywhere.

There are many types of bacteria and they vary tremendously in the way that they get their food and the environments that they can live in. Almost all food types contain some type of bacteria.

## Movement:

Not all bacteria move, but some have cilia or flagella to help them.



cilia



flagella

## Work of Bacteria:

1. Saprophytes  
-live off dead animals and vegetable matter (help decompose)
2. Symbionts  
-live on living animal or vegetable matter - and provide help (they often help us a lot - such as bacteria in the gut that make vitamins for us)
3. Parasites  
-Do not help as they rob the host of nutrients. They may kill the host.  
-These bacteria are pathogenic (or disease-causing)

## Shapes of Bacteria:

- \*round (or cocci)
- \*rod (or strep)
- \*corkscrew (or spirilla)

On top of that, when a whole lot of one type of bacteria grow together, they make different patterns and different colours. Many bacteria can therefore be identified by the shape of their colonies.

When you look at bacteria without a microscope, you are looking at a bacterial colony.

### Uses of bacteria:

- \*Help make food (e.g. cheese, pickles, sauerkraut)
- \*Help make leather, tobacco, silage, textiles, pharmaceuticals and detergents
- \*Help make compost
- \*Make antibiotics to help us cure diseases

### Bacterial Diseases:

\*Lockjaw, cholera, gangrene, leprosy, dysentery, TB, syphilis, boils, food poisoning.

### Food Handling Practices

In good conditions, bacteria can double in number every 10 - 30 minutes. It is important to keep hands and surfaces clean and keep food either piping hot or in the fridge to prevent food poisoning.,