

KS3 Biology



7A Cells





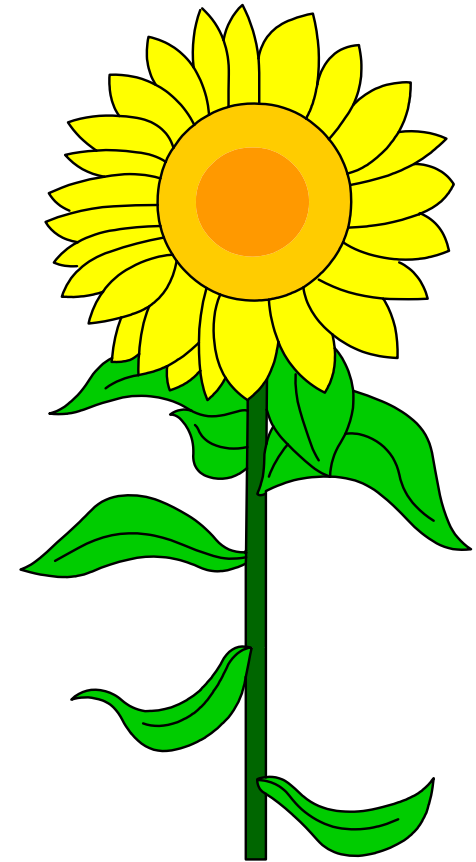
7A Cells

- **What are cells?**
- **Animal and plant cells**
- **Cells to organisms**
- **Where do cells come from?**
- **Summary activities**



What are living things made of?

- Cells are the building blocks of life.
- They come in all shapes and sizes.
- Some organisms are made up of only one cell and are called **uni-cellular**.
- Others are made up of lots of cells and are called **multi-cellular**.
- Cells work together and carry out the seven life processes that are needed for an organism to stay alive.





Movement

Respiration

Sensitivity

Growth

Reproduction

Excretion

Nutrition





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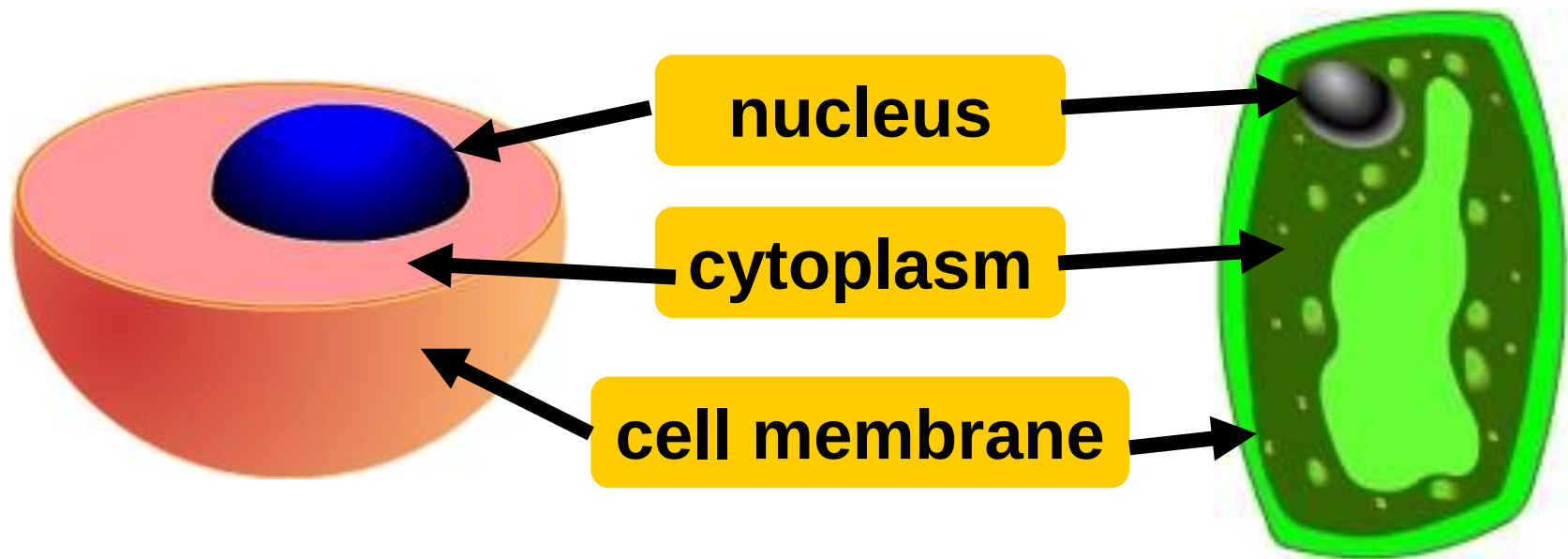


What is a cell?

Animal and plant cells come in different shapes and sizes, but they all have three basic features.

animal cell

plant cell



Plant cells also have some extra features that make them different to animal cells.



The cell – a living factory!



Each cell is just like a factory.



**How can the three main parts of factory
be compared to the parts of a cell?**





What does each part do?

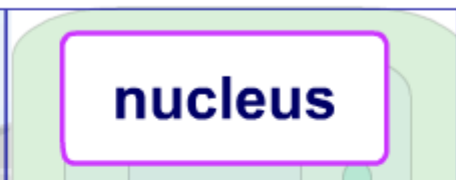


How are parts of a cell like parts of a factory?

factory part

cell part

function

		
factory floor	nucleus	
		protection/ regulation

cytoplasm

reactions
occur here

boardroom
and office

control of
reactions

wall
and gates

cell
membrane



solve

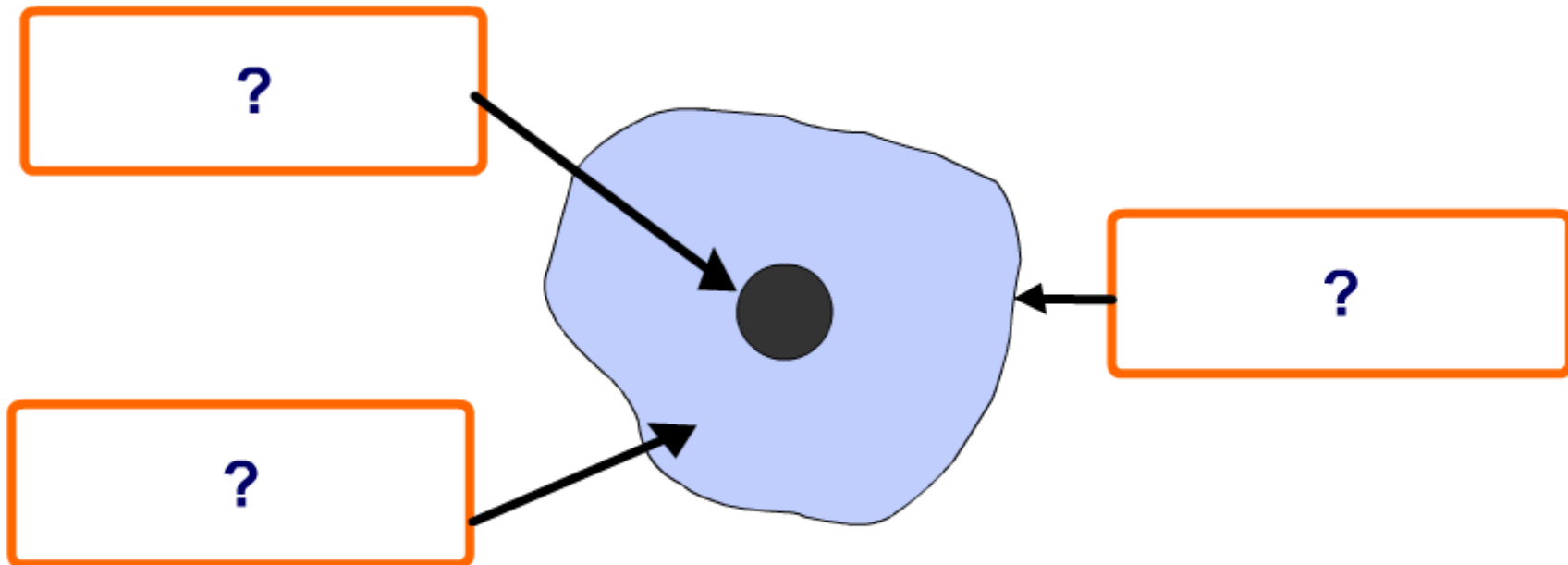




A typical animal cell



What are the parts of a typical animal cell called?



?

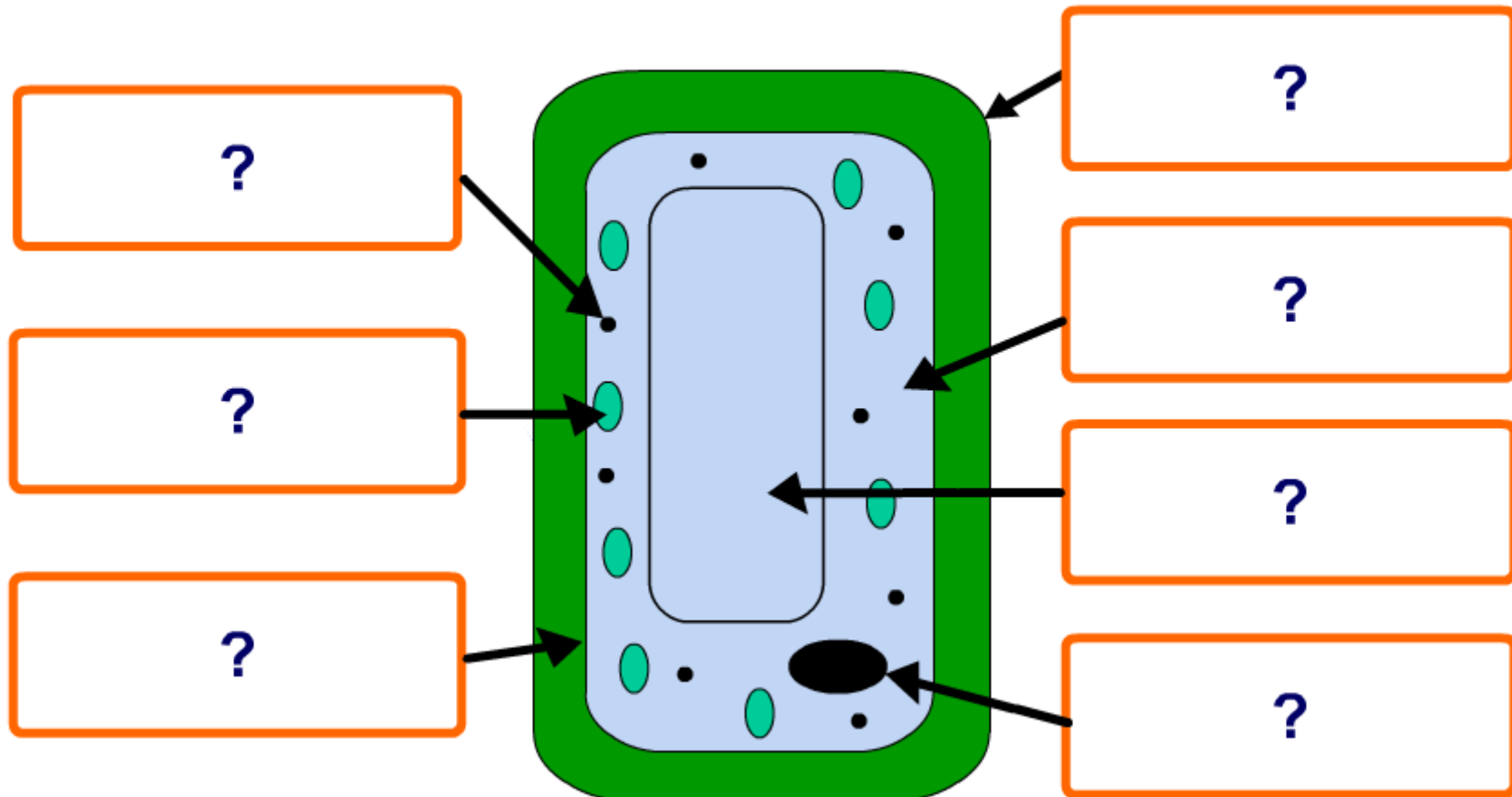




A typical plant cell



What are the parts of a typical plant cell called?



?

?

?

?

?

?

?

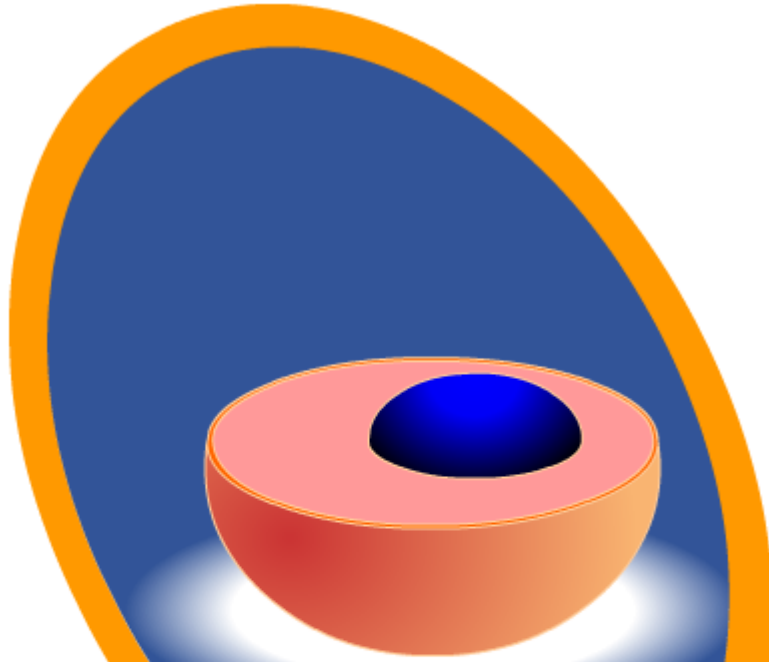
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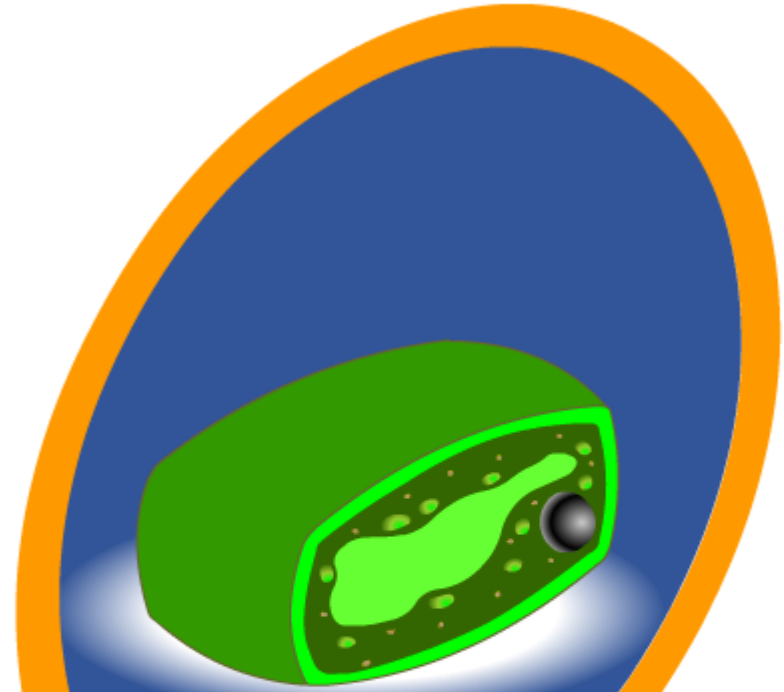
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Typical animal and plant cells



animal cell



plant cell





Comparing cell structure



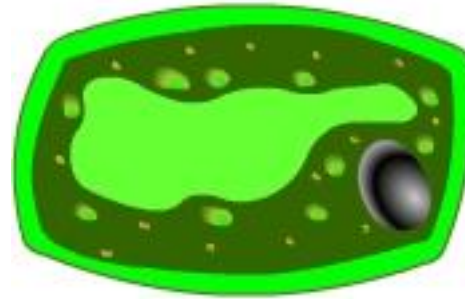
Are these cell parts found only in typical animal cells, only in typical plant cells or in both?

cell part	animal	plant
cell wall		
cell membrane		
chloroplast		
cytoplasm		
nucleus		
vacuole		

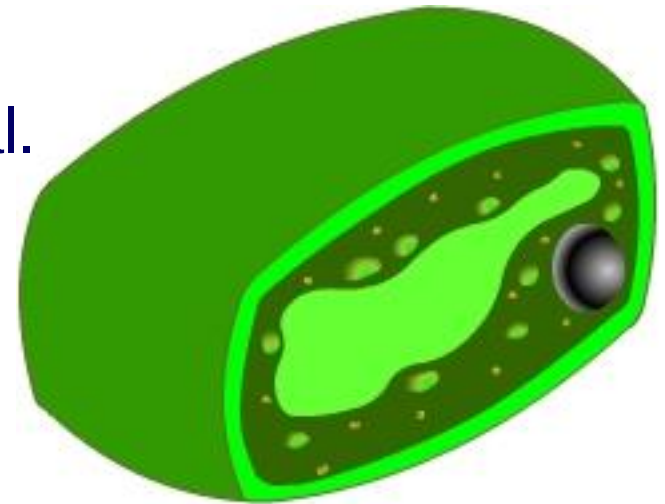




Cells are not really flat...



...they are usually three-dimensional.



The 3D shape of the cell will be determined by its location in the body and the job that it does.





Do all cells look the same?

Most cells have three basic parts.

nucleus

cytoplasm

cell membrane

But cells can be different shapes and sizes and also have different functions. This is because they are...

specialized

The shape of a cell is related to its function.

Where do you see this idea in sport?

CLUE: World Cup!





Why are the players in a rugby union team different shapes and sizes?



The players in rugby team are different shapes and sizes because they do different jobs for the team.

Like rugby players, cells are different shapes and sizes because they perform different jobs.





Whose cell is it anyway?



What are these different types of cells called?

red blood
cell

palisade
cell

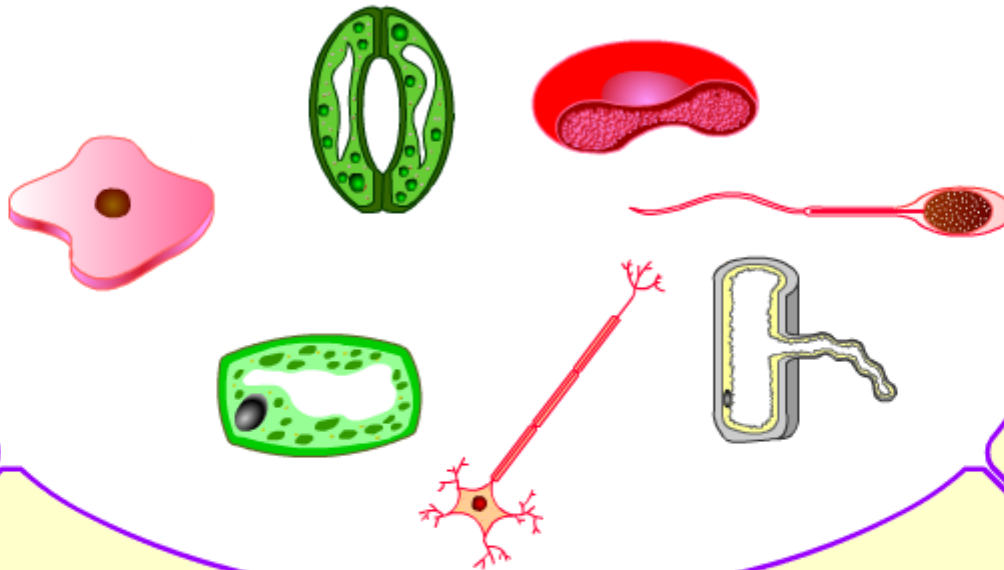
guard cell

skin cell

root hair cell

sperm cell

nerve cell





Make a cell – model

You can make your own 3D cell using the following equipment:

- **plastic bag**
- **cellulose paste**
- **cardboard box**

You will need to find some small objects to suspend in the cellulose paste. These will represent the internal structures of the cell.

Make a model of a typical plant and animal cell.





Make a cell – role play

One way to visualize how a cell functions, is to become a cell!

Some people stand in a circle, holding hands to represent a **cell membrane**. Other people can be the **nucleus** and so on.

You must have a minimum of a cell membrane and a nucleus. Choose from the list for other parts and role play cell activity.

- cell membrane
- nucleus
- cytoplasm

- vacuole
- chloroplast
- cell wall

If you are feeling adventurous, you could even dress up to represent the job of your part of the cell.





7A Cells

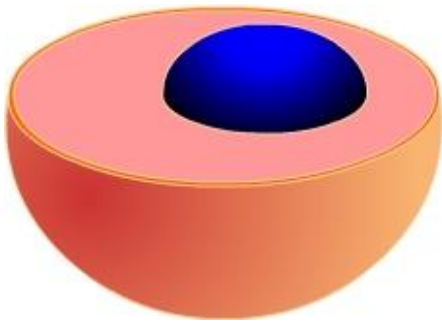
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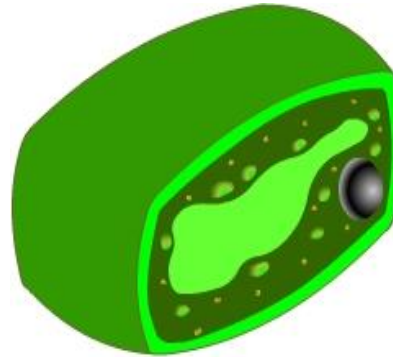


All living things are made of cells. The appearance of each living thing is the result of the types of cell that it is made of and how these cells are organized.

animal



plant

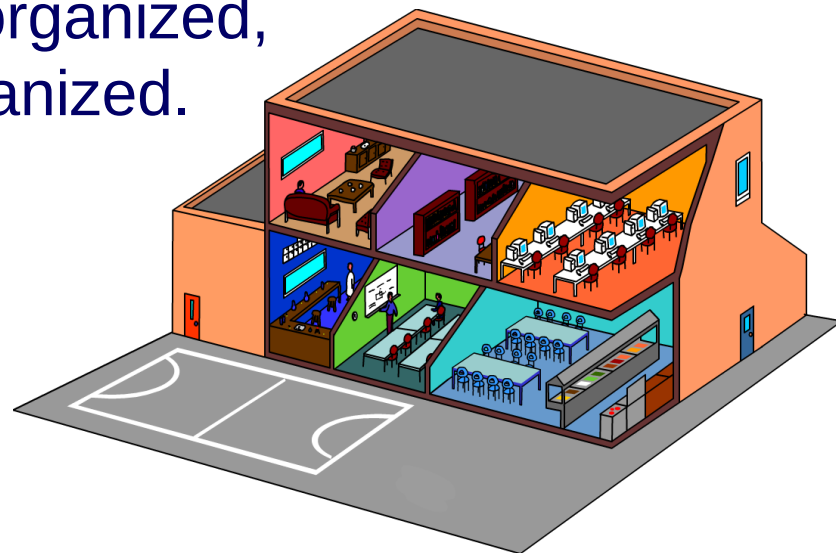




How is the body organized?

To understand how the body is organized, think about how a **school** is organized.

A school needs to be very organized. Every pupil in the school needs to know where they should be and what they are doing. However...



Not all pupils study the same subjects.

Not all pupils can work together efficiently.

There is not room for all the pupils to be in the same place.





How is the body organized?

A school is made up of an **organized system**.

Individual pupil



Registration group



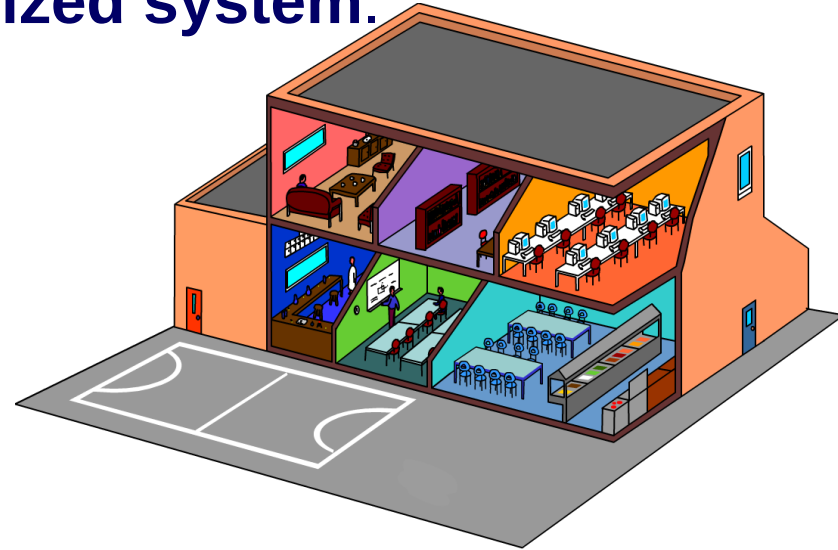
Subject class



Year group



School

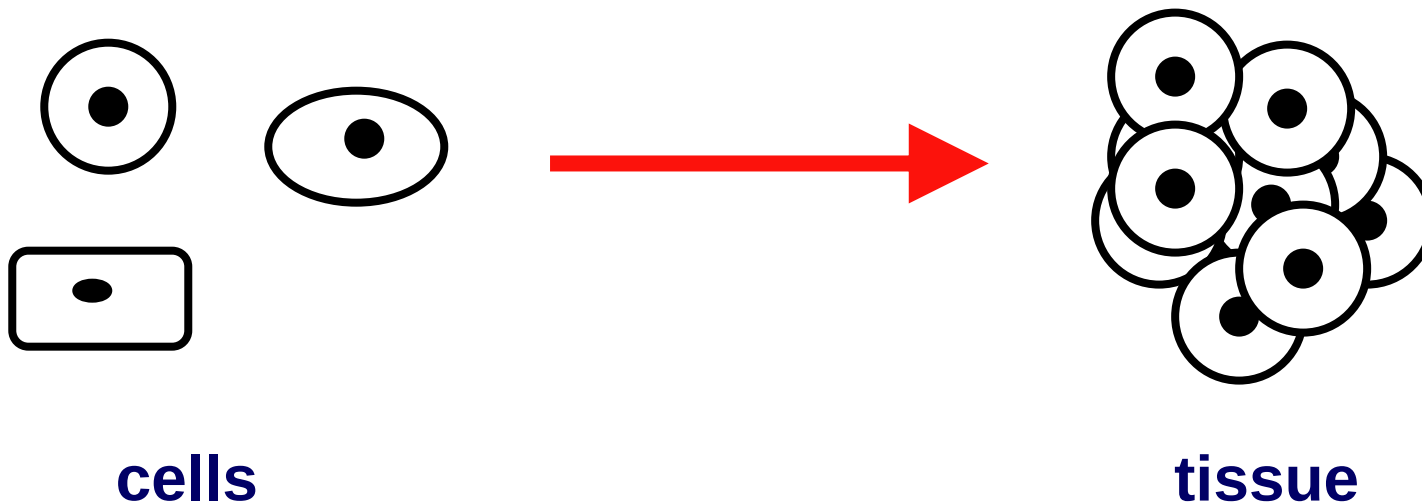




How is the body organized?

Living things are made up of organized systems.

Each specific cell is grouped with cells similar in structure and function to form a **tissue**.





Animal tissues

muscle

bone

liver

skin

lung

Plant tissues

mesophyll

phloem

xylem

Can you think of any more types of tissue?





How is the body organized?

Cells are the
basic units of
life.

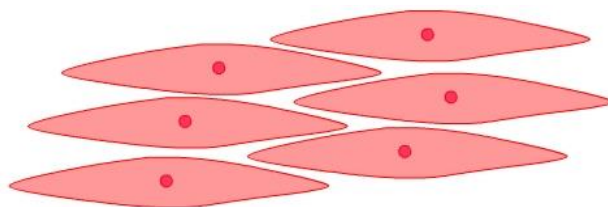
Groups of cells
work together
to form tissues.

Groups of tissues
work together to
form organs.

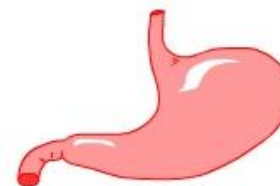
cell



tissue



organ





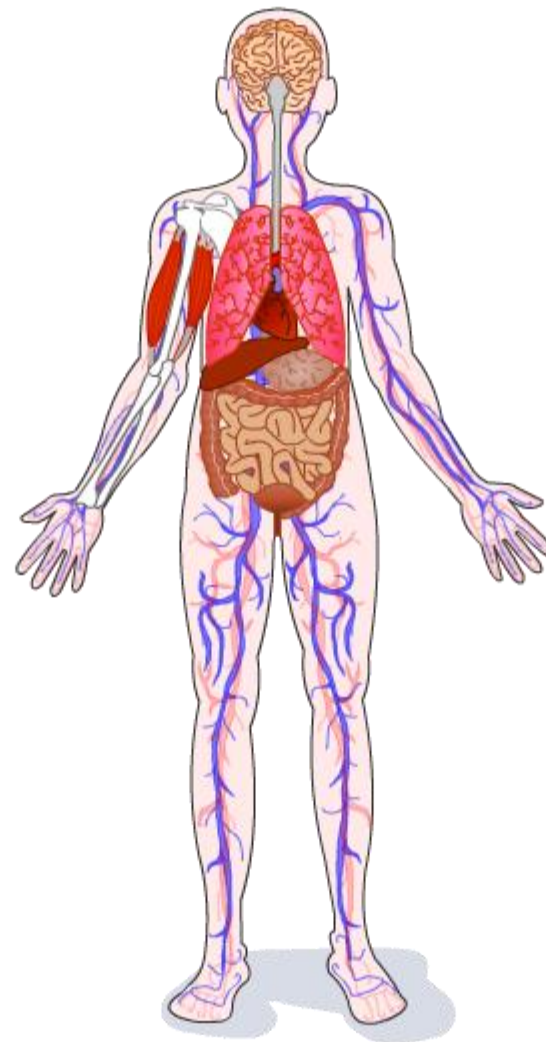
How is the body organized?

Groups of organs form **systems**.

For example, the human digestive system is made up of several organs including the mouth, gullet, stomach and small intestine.

The different organs in a system are linked together by tubes or vessels.

What other human body systems can you think of?

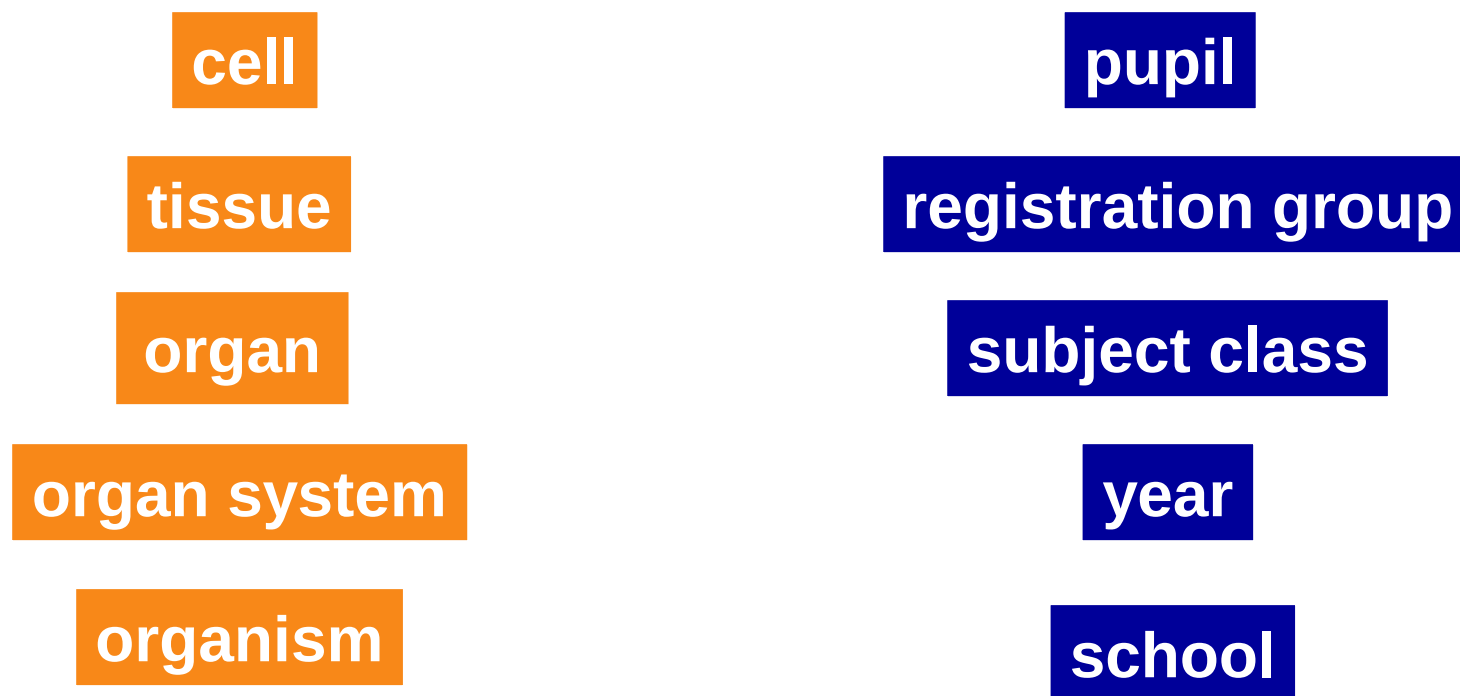




How is the body organized?

The body is made up of different organ systems working together to carry out all the functions of a living organism.

Both the body and schools are organized systems:

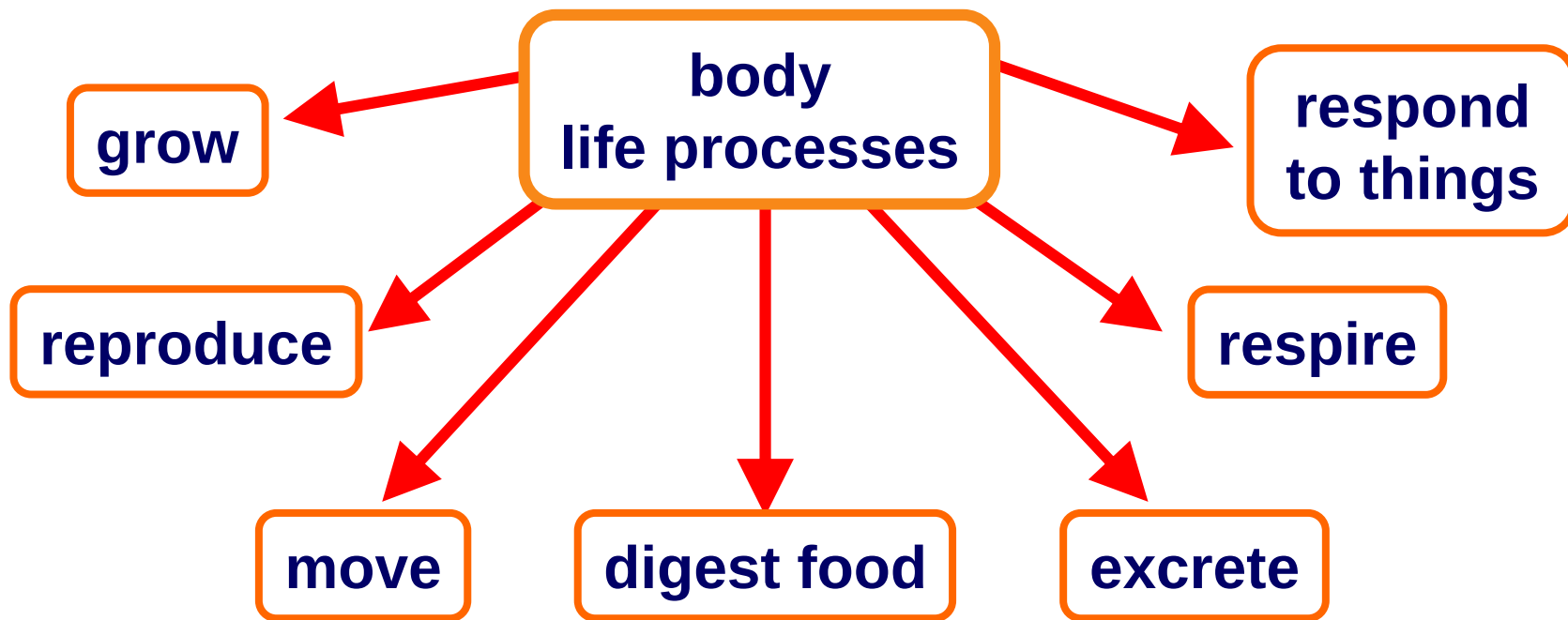




How is the body organized?

Why do organisms have to be so organized?

Organization of the body allows complex organisms to carry out many different jobs at the same time.



Being organized means that the body does not waste energy, so it is more efficient.



Match the organs to the human body systems.

Sensory system	=	?	eyes, ears, nose
Reproductive system	=	?	stomach, intestines
Blood system	=	?	windpipe, lungs
Excretory system	=	?	ovaries, testes
Digestive system	=	?	heart, blood vessels
Breathing system	=	?	brain, nerves
Nervous system	=	?	kidneys, liver

?



solve





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When does the body need to produce new cells?

Think of the following situations.....

growth

Your body loses cells and cells are constantly dying but your skin doesn't disappear and you don't get smaller.

repair

You cut your finger. The wound is eventually healed and weeks later you cannot even see where the cut used to be.

reproduction

Your body can make sex cells. In humans, these cells are sperm or egg cells. These cells contain the same genetic information that can be found in other body cells.





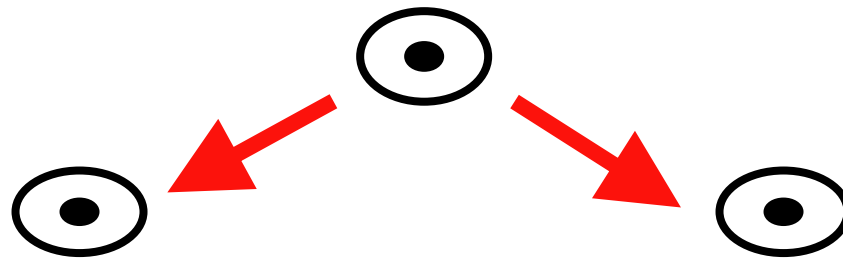
How does the body produce new cells?

The body needs to produce new cells for three main reasons:

- growth
- repair
- reproduction

How does it produce these cells?

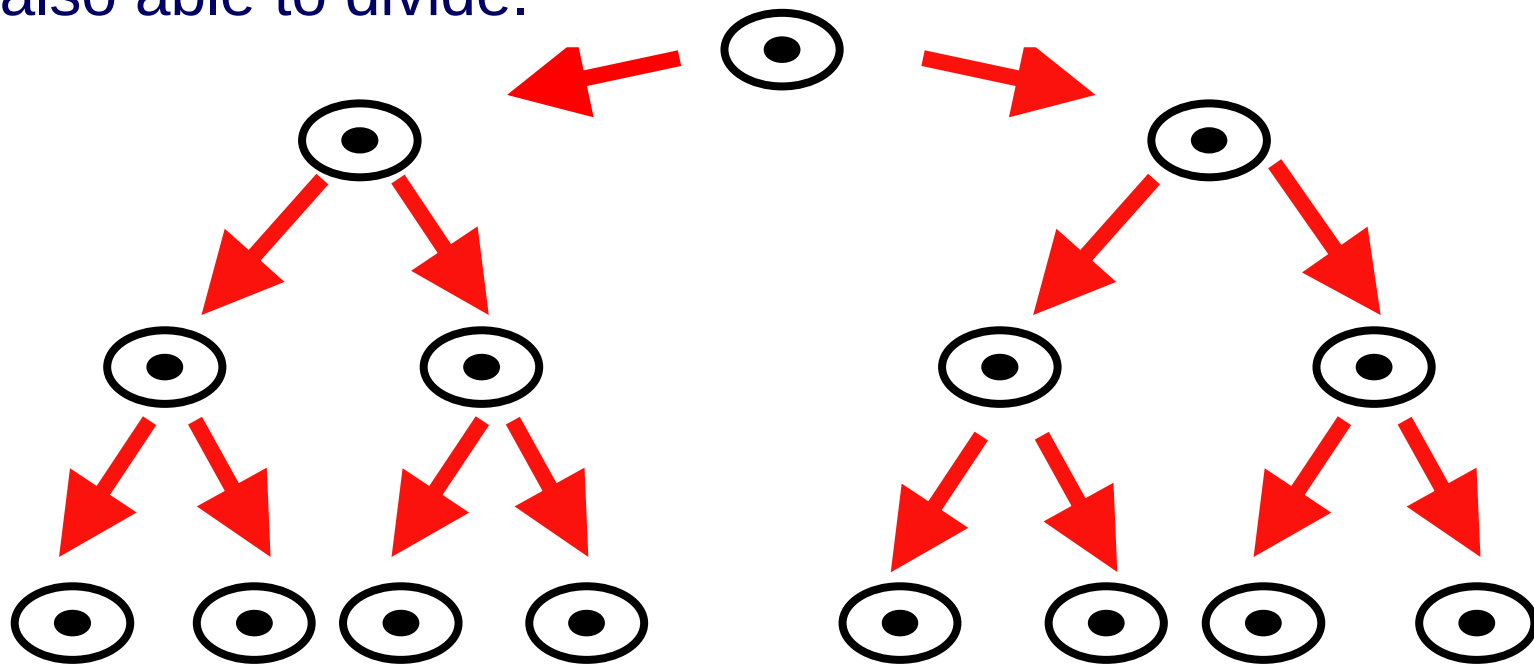
The body is constantly producing new cells from old cells dividing. This is called **cell division**.





Where do cells come from?

Cell division occurs extremely quickly and each new cell is also able to divide.



Cell division makes it possible for the body to:

- **grow** quickly;
- **repair** cuts and replace dead cells quickly;
- produce an enormous number of **reproductive** cells.

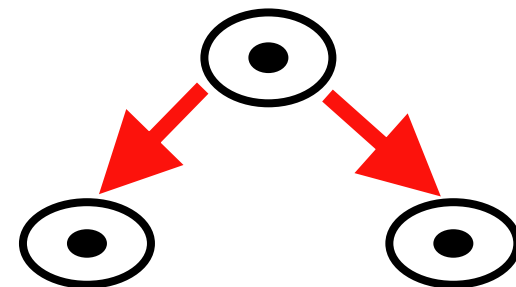




Where do cells come from?

New cells are produced by cell division, but this doesn't mean that cells split in half.

What would be the problem if cells did split in half to produce new cells ?



There wouldn't be much of the cells left!

What actually happens is that cells have to make new copies of the material inside them, as well as new membranes before they divide.

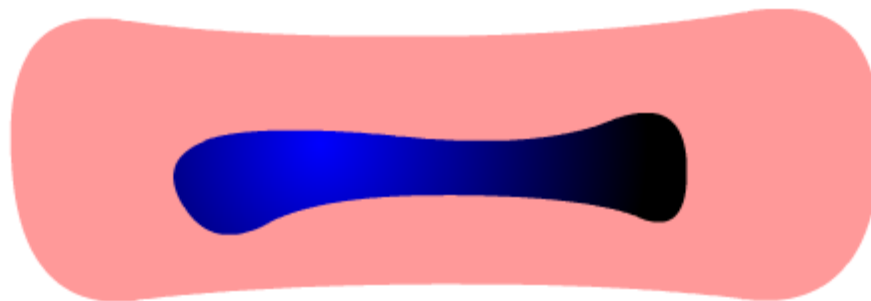
Just before a cell divides, it appears to grow slightly as it reproduces everything inside itself.

The nucleus doubles in size and then divides into two equal halves.





Cell division



Click on the play button to find out about cell division.





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- **cell** – The building block that all living things are made of.
- **cell membrane** – The thin flexible covering of a cell that controls what enters and leaves the cell.
- **cell wall** – The rigid outer layer of a plant cell that gives the cell its shape.
- **chloroplast** – The part of a plant cell containing chlorophyll.
- **cytoplasm** – The liquid material inside a cell.
- **nucleus** – The control centre of a cell.
- **organ** – A group of tissues that work together.
- **system** – A group of organs that work together.
- **tissue** – A group of the same type of cells that work together.
- **vacuole** – A space inside a cell filled with watery sap.





How quickly can you unscramble
anagrams of words about

c e i l s ?

Click start for the first of ten anagrams.

start





Complete the sentences about cells.

1. All living things carry out the _____ characteristics of life.
2. The characteristics of life are movement, reproduction, sensitivity, _____, respiration, excretion and nutrition.
3. All living things are made up of _____.

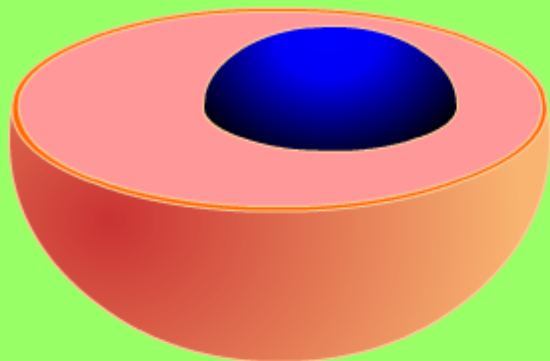


systems	growth	ten	nucleus
cell mass	vacuole	organs	tissue
cells	seven	six	light

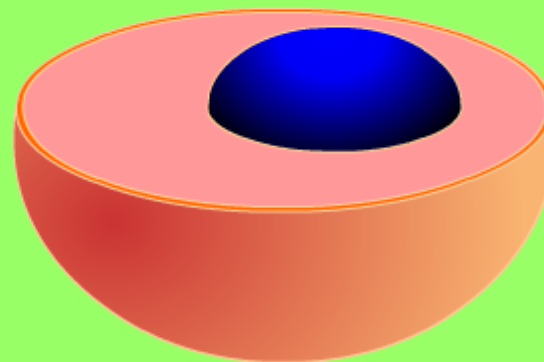
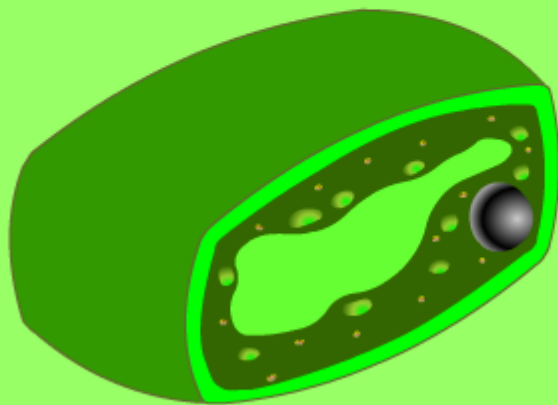
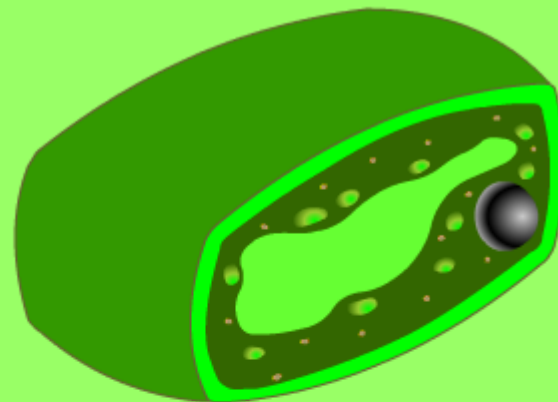




Multiple-choice quiz



Try this quiz
about cells
to check that
your know-how
hasn't passed
its cell-by date!



start

