

Science KS3 Cells and organisms

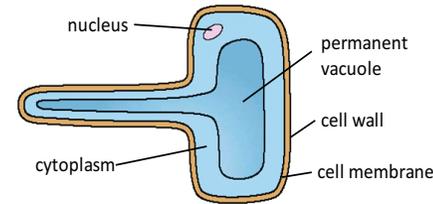


Glossary:

- **Cell**
Building blocks of living organisms.
- **Cell membrane**
Controls movement in and out of cells.
- **Cell wall**
Strengthens the cell.
- **Chloroplast**
Where photosynthesis occurs.
- **Cytoplasm**
Where chemical reactions happen in a cell.
- **Embryo**
Ball of cells formed from a fertilised egg.
- **Fertilised egg**
Formed when a sperm and egg fuse together.
- **Function**
Its job.
- **Microscope**
Equipment used to see things which are too small to see with the naked eye.
- **Mitochondria**
Where respiration occurs.
- **Nucleus**
Controls the cell, contains DNA.
- **Organ**
Groups of tissues with the same function e.g. a heart.
- **Organ system**
A group of organs with a specific function.
- **Organism**
An individual living thing e.g. bacteria or a human.
- **Photosynthesis**
Chemical reaction which produces glucose.
- **Respiration**
Chemical reaction which releases energy from glucose.
- **Ribosome**
For making proteins.
- **Specialised cell**
A cell which has a specific function.
- **Stem cell**
An unspecialised cell.
- **Tissue**
Formed from lots of the same type of cell e.g. muscle.
- **Vacuole**
Filled with cell sap.

Activities

- Compare and contrast a plant and animal cell. You should include similarities and differences in your answer.
- The following plant cell is specialised.
 - Explain how it is different to a general plant cell.
 - The cell is a 'root hair cell', how do these differences link to its function?



- Specialised cells enable organs to carry out their functions. For each of the following specialised cells state their function.
 - a) Red blood cell
 - b) Nerve cell
 - c) Leaf cell
 - d) Sperm cell.
- If too much water diffuses into a red blood cell it will burst. Explain what stops this happening in a plant cell.
- In terms of cells, explain how a kitten grows into an adult cat.

- Some people are against the use of stem cells because of ethical concerns. Research the advantages and disadvantages of using different types of stem cells in medicine. Produce a summary which:
 - a) Explains the difference between adult stem cells and those from an embryo
 - b) Explains the benefits and potential issues of stem cell use in medicine.

QUICK QUESTIONS:

1. Draw and label a standard plant and animal cell.
2. State 3 differences between plant and animal cells.
3. State the main function of the following body systems:
 - a) Breathing system
 - b) Circulatory system
 - c) Digestive system
 - d) Reproductive system
 - e) Renal (Kidney) system.

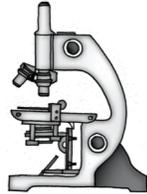


1. Cells

- All living things are made **of** one or more **cells** which can only be seen through a **microscope**.
- All the basic properties of life are the result of what happens inside cells. This includes:

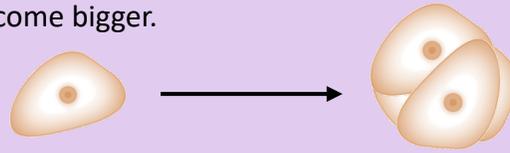


- **Reproduction**
- **Respiration**
- **Photosynthesis**



4. Cell division

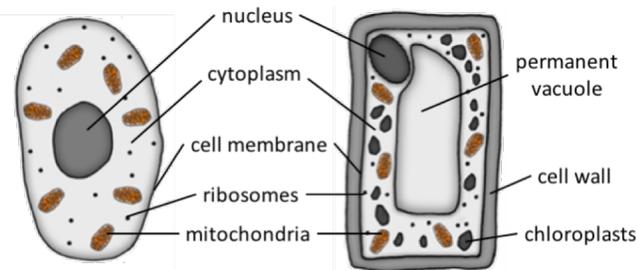
- Cells divide for **growth** and **repair**.
- For an **organism** to grow the cells need to divide to make more cells. Growth happens because the cells inside the organism divide, **not** because all the cells become bigger.



2. Parts of a cell

Nucleus	Controls the cell
Cell membrane	Controls movement in and out of a cell
Cytoplasm	Where chemical reactions happen
Mitochondria	Respiration
Chloroplast	Photosynthesis
Cell wall	Strengthens the cell
Vacuole	Filled with cell sap

3. Plant and animal cells



animal cell

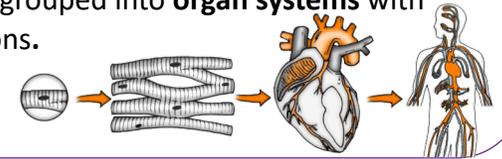
plant cell

5. Specialised cells

- In **multi-cellular organisms** there are many different types of cell.
- These cells are **specialised** and are slightly different to the 'standard' plant and animal cells. These differences help the cell to carry out its **function**.
- For example, muscle, blood and nerve cells carry out specific functions in an organism.

6. Tissues and organs

- Cells are often organised into **tissues**.
- Tissues contain lots of the **same type of cell**.
- **Organs** contain **groups of tissues** with the **same function**.
- **Organs** can be grouped into **organ systems** with specific functions.



7. Organ systems

- In the body, **organ systems** carry out key functions such as **respiration**, **digestion**, **elimination** of waste and **temperature** control.
- The **circulatory system** takes substances to and from cells.
- The **digestive system** breaks down food into smaller pieces which can be absorbed into the body.

8. Stem cells

- **Stem cells** are not specialised.
- They can repair cells by being programmed for different functions.
- Stem cells can be found in adults in their **bone marrow** and in **embryos**.
- As they are not specialised, stem cells could be used to **treat** certain health conditions by replacing damaged cells.



KS3 Spine

Cells and organisms