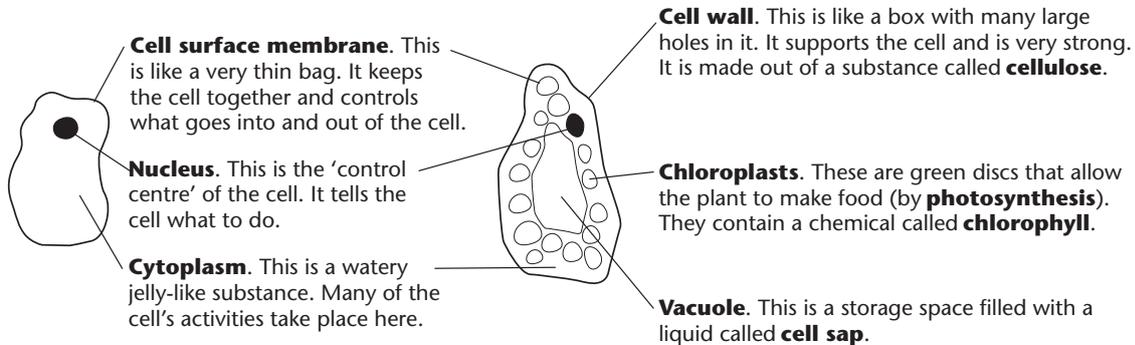


Tissues and transplants

All living things are made from **cells**. There are two basic types of cell:



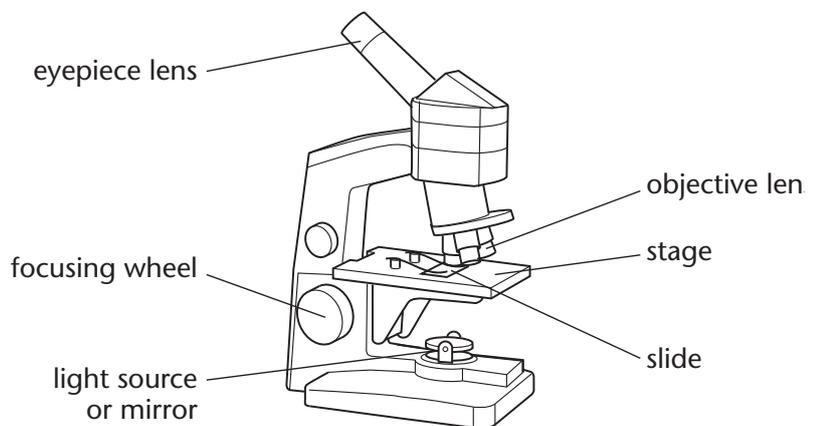
An animal cell.

A plant cell.

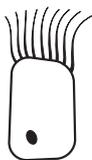
Cells are very small. A **microscope** is used to see them. A microscope **magnifies** things. To work out the total magnification, you multiply the magnification of the **objective lens** by the magnification of the **eyepiece lens**. The object you want to look at with a microscope is the **specimen**. It has to be thin to let light get through it. It is placed, with a drop of water, onto a **slide**. A **coverslip** is put on top. The coverslip stops the specimen from drying out, holds it flat and stops it moving. A **stain** might be used to help you see parts of the cell.

To use a microscope you:

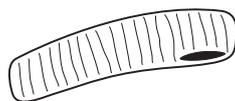
- A** place the smallest objective lens over the hole in the stage;
- B** turn the focusing wheel to move the objective lens close to the stage;
- C** place the slide on the stage;
- D** adjust the light source or mirror;
- E** look into the eyepiece lens;
- F** turn the focusing wheel until what you see is **in focus**.



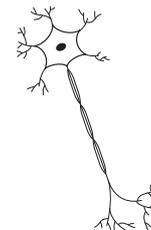
Some animal cells are **adapted** to do certain **functions**.



Ciliated epithelial cells are found in tubes leading to the lungs. The strands at the top (**cilia**) wave about to move dirt out of the lungs.

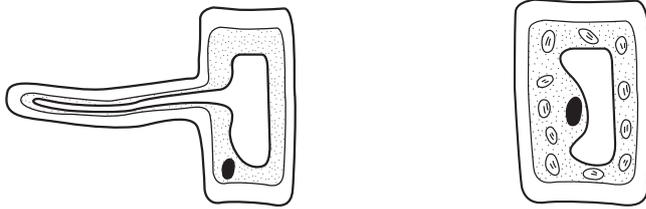


Muscle cells are able to change length. This helps us to move.



Nerve cells (neurons) are long so that signals can be carried around the body quickly.

Some plant cells are adapted to do certain functions

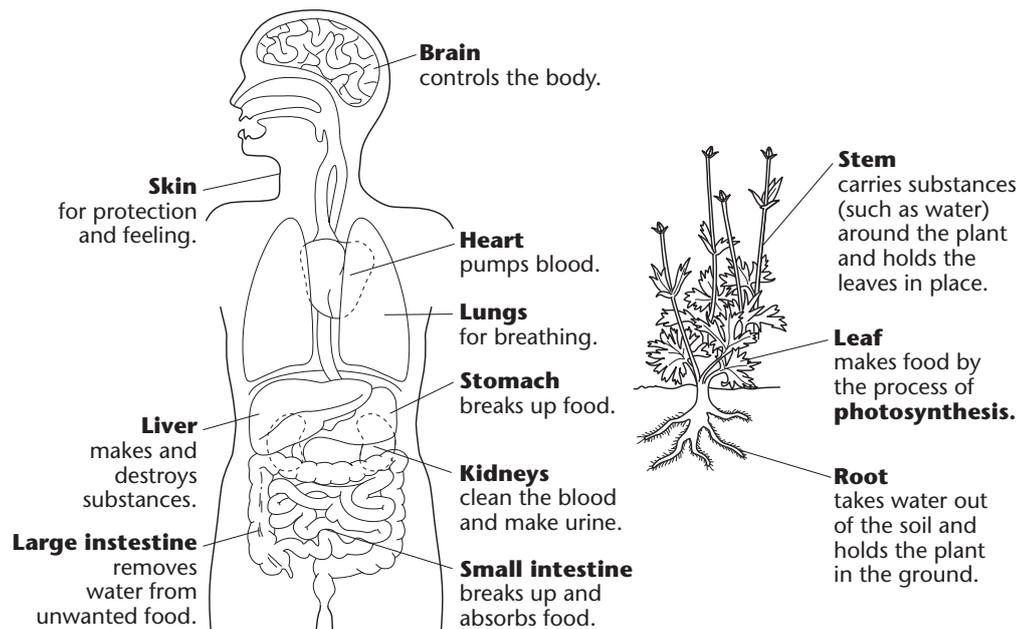


Root hair cells in plant roots take water out of the ground quickly. The root hair gives the water more surface to get into the cell.

Palisade cells in plant leaves are packed with chloroplasts to help the plant make food.

A group of cells that are the same, all doing the same job, is called a **tissue** (e.g. muscle tissue). A group of different tissues working together to do an important job is an **organ**. For example, the **heart** is an organ and is made of muscle tissue and nerve tissue.

Organs have important functions:



Organs often work together in **organ systems**.

Organ system	Organs	Job
breathing system	windpipe (trachea), lungs	takes air into the body and gets rid of waste gases
circulatory system	heart, blood vessels	carries oxygen and food around the body
digestive system	mouth, gullet, stomach, intestines	breaks down our food
nervous system	brain, spinal cord, nerves	carries signals around the body