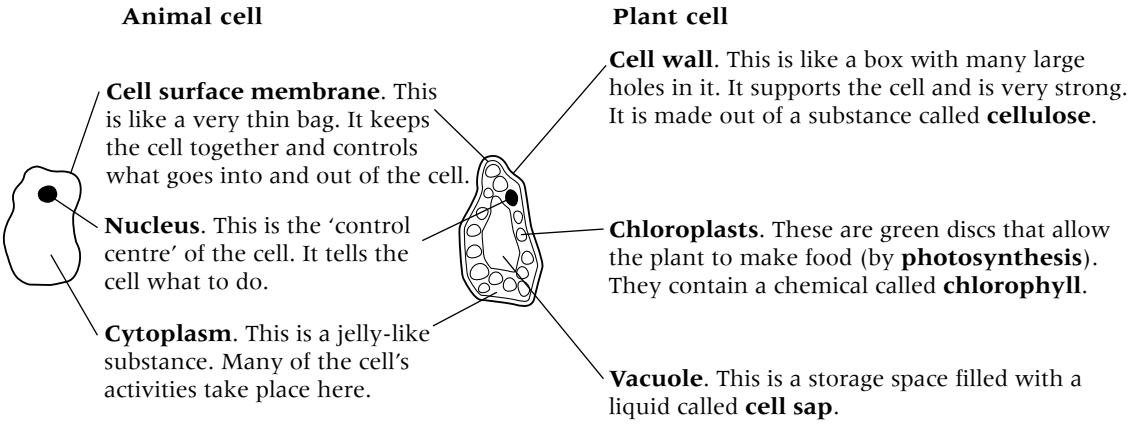
7A Summary Sheets

Cells and their functions

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



Cells are very small. A **microscope** is used to see them.

To use a microscope you:

i Place the smallest objective lens over the hole in the stage.

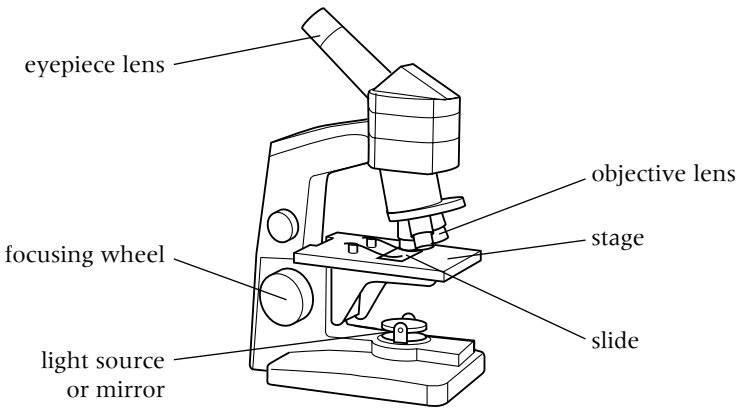
ii Turn the focusing wheel to move the objective lens close to the stage.

iii Place the slide on the stage.

iv Adjust the light source or mirror.

v Look into the eyepiece lens

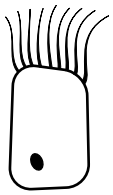
vi Turn the focusing wheel until what you see is clear (**in focus**).



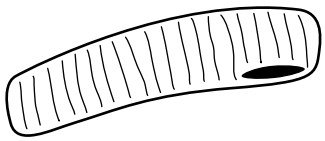
A microscope makes things appear bigger. It **magnifies** things. There are two **lenses** in a microscope. To work out the total **magnification** you multiply the magnification of the **objective lens** by the magnification of the **eyepiece lens**.

The object you want to look at using a microscope is called 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.

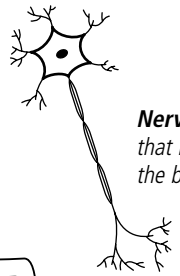
Some cells have special shapes. They are **adapted** to do certain jobs.



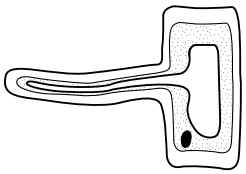
Cilated epithelial cells *are found in tubes leading to the lungs. The strands at the top (**cilia**) wave about to move dirt out of the lungs.*



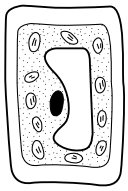
Muscle cells *are able to change length. This helps us to move.*



Nerve cells (neurones) *are long so that messages can be carried around the body quickly.*



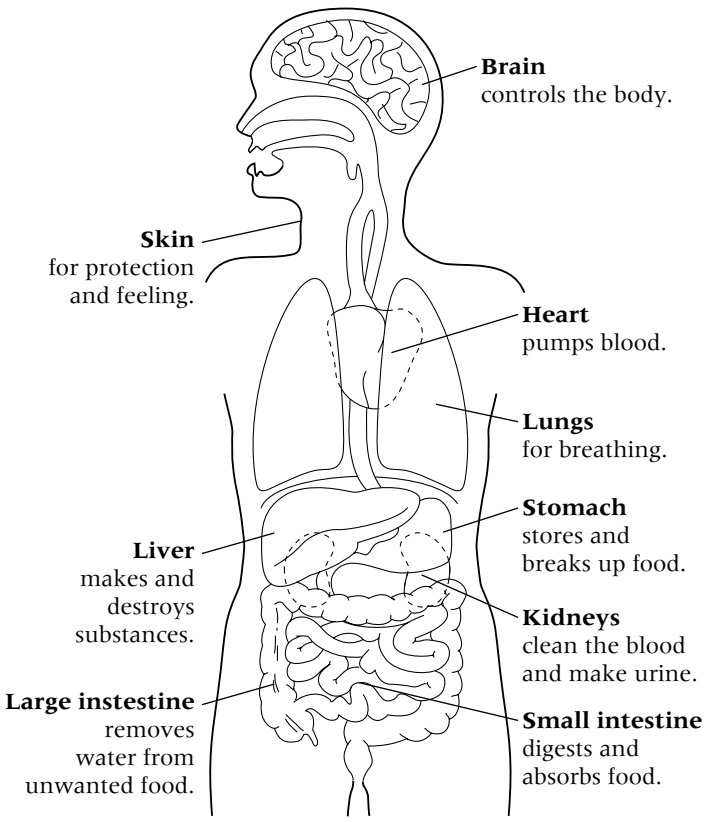
Root hair cells *in plant roots take water out of the ground quickly. The root hair gives the water more surface to get into the cell.*

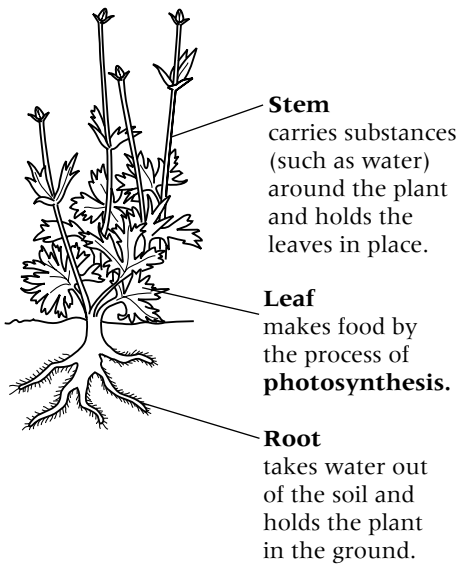


Palisade cells *in plant leaves are packed with chloroplasts to help the plant make food.*

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 makes an **organ**. For example the **heart** is an organ and is made of muscle tissue and nerve tissue.

Organs have very important jobs:



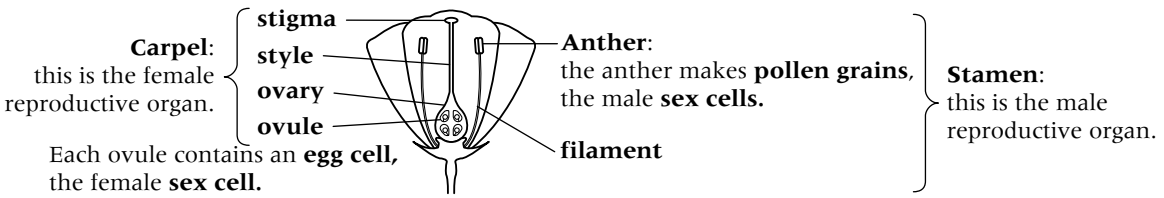


Organs often work together in **organ systems**.

Some important organ systems:

Organ system	Organs	Job
Breathing system	Windpipe (trachea), lungs	Takes air into the body
Circulatory system	Heart, blood vessels	Carries oxygen and food around the body
Digestive system	Mouth, gullet, stomach, intestines	Breaks down our food
Flower	Stamen, carpel	Used for sexual reproduction in plants
Nervous system	Brain, spinal cord, nerves	Carries messages around the body

Sex cells are produced by the **reproductive organs**. In plants, these are contained inside **flowers**. Sex cells are used for **sexual reproduction** which needs two **parents**. The offspring from sexual reproduction are different from the parents; they are new **varieties**.



The **pollen grains** need to be carried to the **stigma** of another flower. They can be carried by insects or the wind. The carrying of pollen from an anther to a stigma is called **pollination**.

Once on the stigma, a pollen grain grows a **pollen tube** which enters the **ovule** containing an **egg cell**. The nucleus from the pollen grain then joins with the nucleus inside the egg cell. This is called **fertilisation**.