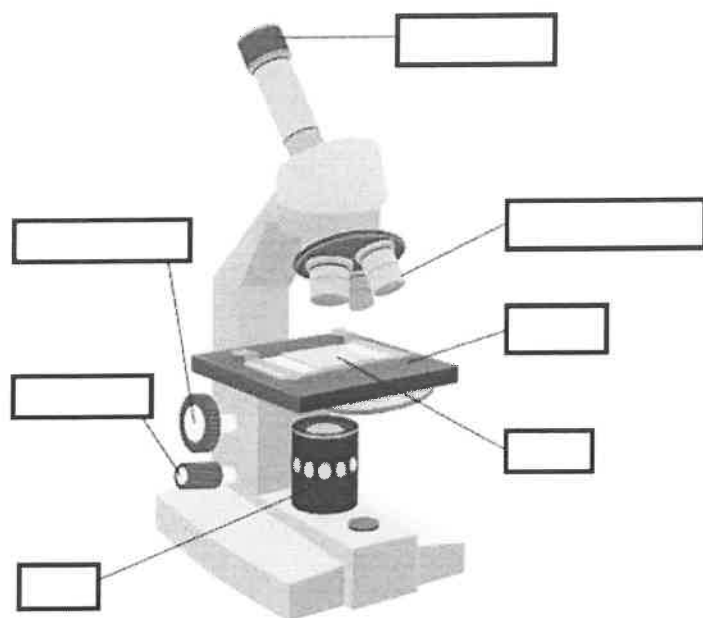


Science

Microscopes

Label the microscope.



Cells Farrevision Booklet

Microscopes magnify small objects to make them look bigger.

Magnification is done through the eyepiece and the objective lens. To find the total magnification, you multiply the eyepiece magnification by the objective lens magnification.

Sometimes you can't see the specimen very well, so you add iodine to it to stain it, this will give it a purple colour.

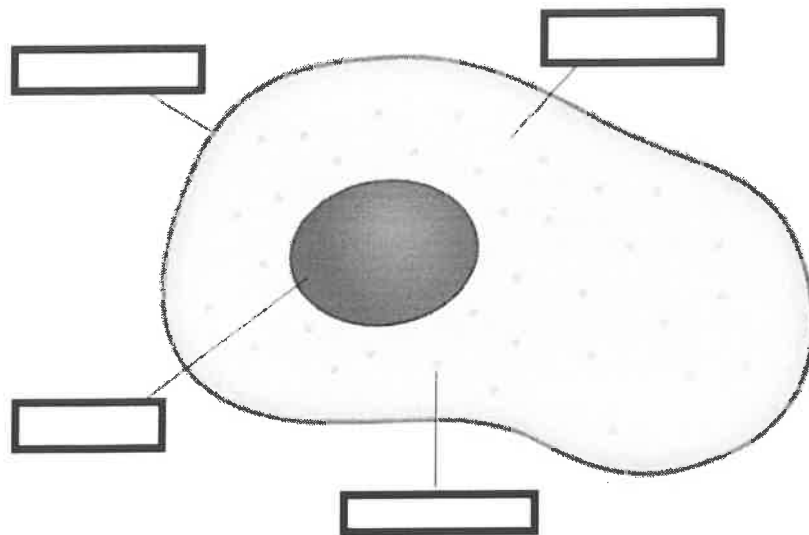
Example: If an eyepiece has a magnification of 5x, and an objective lens has a magnification of 20x, the total magnification is $5 \times 20 = 100$.

Your turn: Complete the table.

Eyepiece magnification	Objective lens magnification	Total magnification
10 x	5 x	
20 x	100 x	
5 x	15 x	
5 x		100 x
	250 x	500 x

Question: Why might you add iodine to a specimen?

Animal Cells



Label the parts of the animal cell:

Cytoplasm
Nucleus
Mitochondria
Cell Membrane

Each part of the cell has a **function** (does something in the cell). **Write the name of the cell next to its function.**

The jelly-like substance where all the chemical reactions of the cell take place.	
The outside layer of the cell which lets some things in and out of the cell.	
These transfer energy to the cell allowing it to carry out its functions. This is called respiration.	
Contains the genetic material of a cell, allowing it to make new cells.	

Fill in the blanks:

The nucleus is like the b_____ of the cell, it has all the instructions for making new cells.

The singular of mi_____ is mitochondrion.

The inside of an animal cell is not empty air, it's filled with c_____.

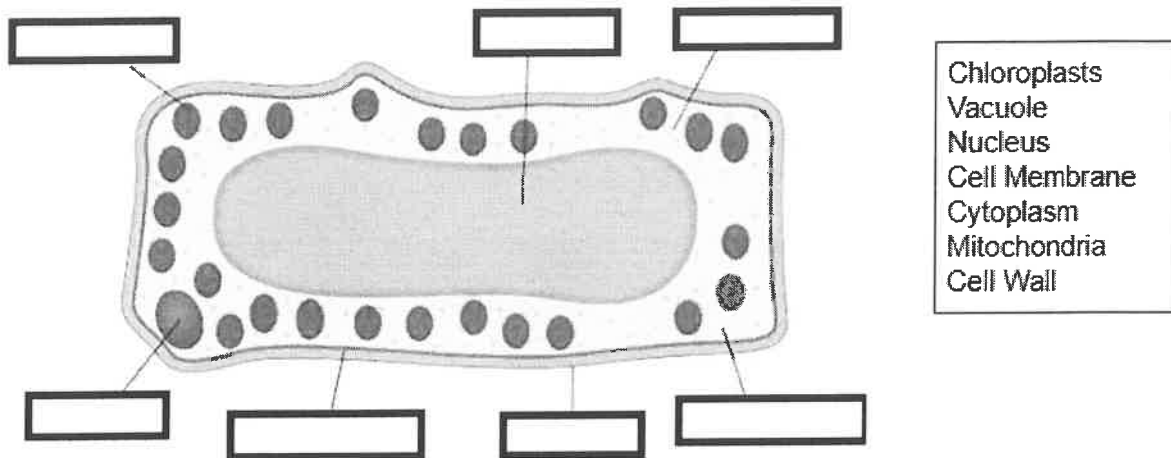
R_____ is the process mitochondria do to turn oxygen and nutrients into energy for the cell.

Animal cells have a _____ only, but plant cells have this as well as something else around the outside.

Animal cells are irregular, they don't fit together like plant cells do. This is useful because animals need to be able to m_____ a lot, but plants don't.

Plant Cells

Label the plant cell with the parts on the right.



Plant cells have some parts which aren't in animal cells. **Write their names next to their functions below.**

This is where photosynthesis happens. They contain a green substance called chlorophyll which traps energy from sunlight.	
Contains a watery liquid called cell sap . It pushes out against the cell and keeps it firm.	
Strengthens the cell and makes it rigid. Contains cellulose which is a tough fibrey material.	

Fill in the blanks:

Plant cells are almost rectangular, they fit together like b_____.

C_____ is a tough material which makes up the cell wall, this keeps the plant r_____.

There is a special type of plant cell called the root ____ cell. This is underground so it doesn't do p_____. Because of this, they don't have ch_____.

Specialised Cells

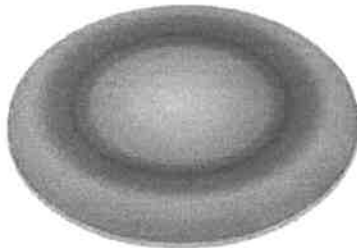
Some cells in animals and plants are called specialised cells, because they have a special function. They look different because they've **adapted** to do their function. **Fill in the blanks in the information below:**

Nerve Cells



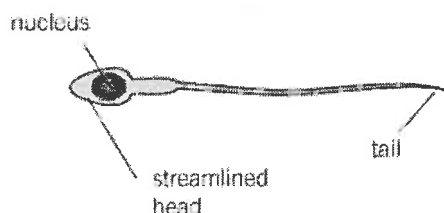
Nerve cells (also called neurons) are long and thin to connect to each other around the body. They transmit messages through e_____ impulses.

Red Blood Cells



Red blood cells are disc shaped which means they have a large surface area. They contain haemoglobin which allows them to carry o_____ around the body.

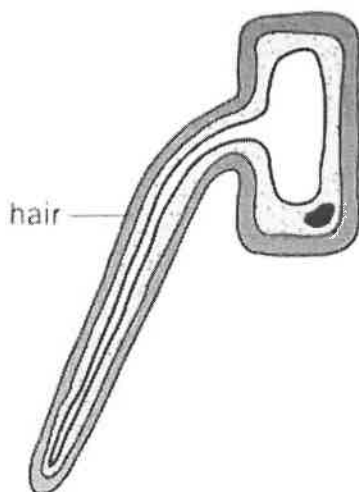
Sperm Cells



Sperm cells have a streamlined head and a long t____ so it can swim through the body and burrow into the e____.

It has lots of mito_____ to give it energy to swim.

Root Hair Cell



Plants have root hair cells, which are part of the plant which is underground. They absorb w_____ and nutrients from the soil. Root hair cells have a large s_____ a_____ for absorbing. They don't have any ch_____ since they are underground, see no sunlight and don't need to carry out ph_____.

Movement of Substances

Cells need some substances to come into the cell, and they need to get rid of some things out of the cell.

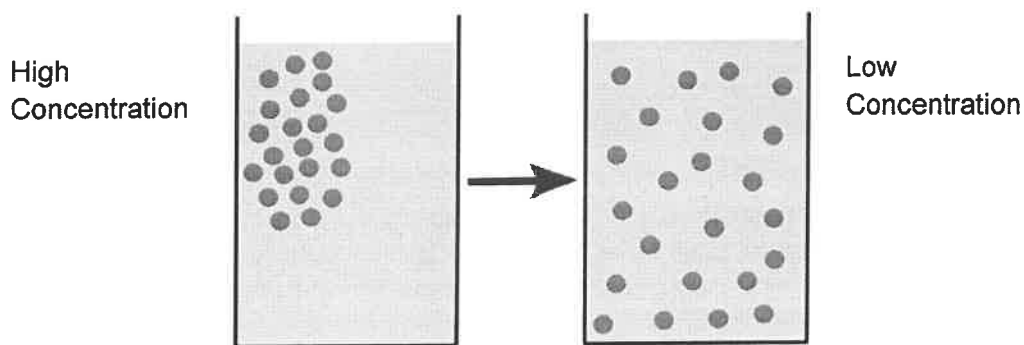
Moving in -

Cells need oxygen and glucose for respiration.

Moving out -

Some chemical reactions inside the cell produce waste products. These include Carbon Dioxide. It leaves the cell into the blood, then travels to the lungs and out of your breath.

Substances move in and out of cells through a process called **diffusion**. Diffusion is the movement of substances from a high concentration to a low concentration.



Plant cells need water for photosynthesis. Water moves from the soil to the root hair cells by diffusion (high to low concentration). It moves from the root hair cells to other cells in the plant through diffusion (high to low concentration). **Questions to answer:**

1. What are two substances cells need to respire?

2. Give an example of a waste product which cells need to get rid of:

3. Describe how substances move via diffusion

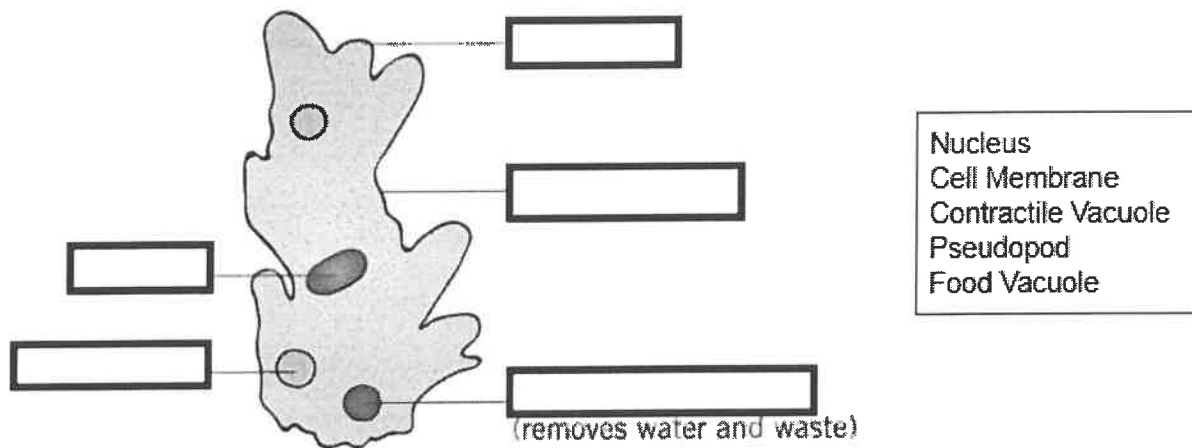
Fill in the blanks:

Plants wilt when they don't get enough w____. The v____ inside the cell can become empty. When it's empty, it no longer pushes up against the edge of the cell. The plant cells are no longer r____, instead they go floppy.

Unicellular Organisms

Unicellular organisms are living things that are made up of only one cell.

An amoeba is a unicellular organism. **Label the parts of an amoeba below:**



Fill in the gaps below:

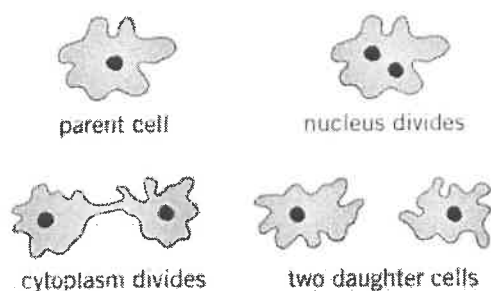
Amoeba move by making their ps_____ longer, pushing them in the direction they want to go.

Amoeba eat by surround their food in a food v_____. They then digest the food.

Amoeba use a co_____ vacuole to release w____ products from the cell.

Amoebas reproducing

Amoebas reproduce by a process called **binary fission**.

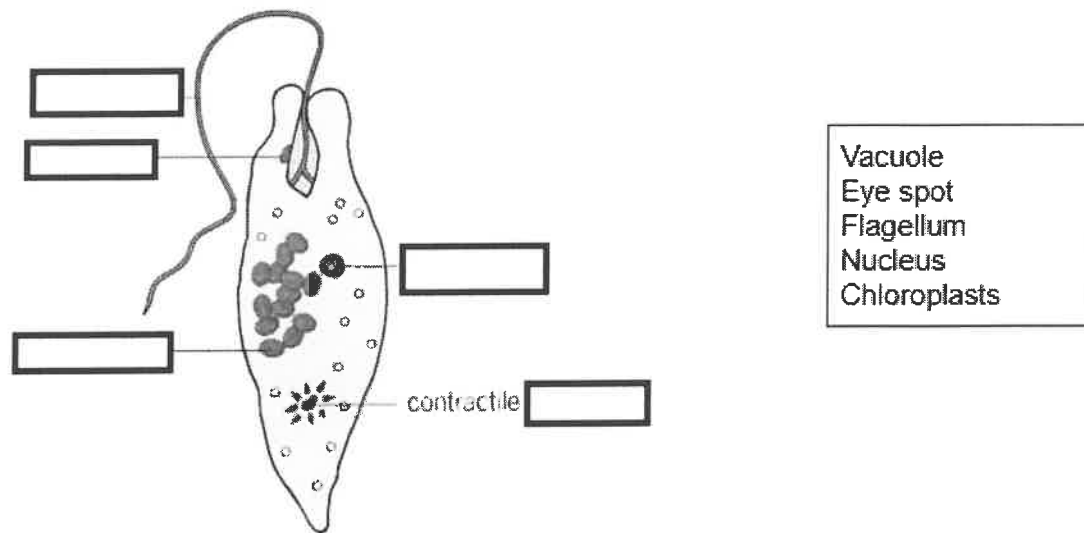


Decide where each step comes, **write 1-4 in one of each boxes below.**

Description	Step Number
The two daughter cells are separate.	
The parent cell starts by itself.	
The cytoplasm divides.	
The nucleus divides.	

Unicellular Organisms 2

A euglena is a microscopic unicellular organism found in fresh water. They have most of the same parts as an amoeba, but also has chloroplasts, which makes them look green. **Label the diagram below.**



The flagellum acts like a helicopter blade, and allows the euglena swim towards the light. It knows where the light is because it can 'see' with its eye spot. Like amoeba, euglena reproduce by binary fission.

Questions:

1. What is the part of a euglena that allows it to swim well?

2. Why do euglena look green? These things also mean the euglena can do photosynthesis.

3. Outline how euglena reproduce, you should have four steps.

4. Describe 3 ways amoeba and euglena are different.
