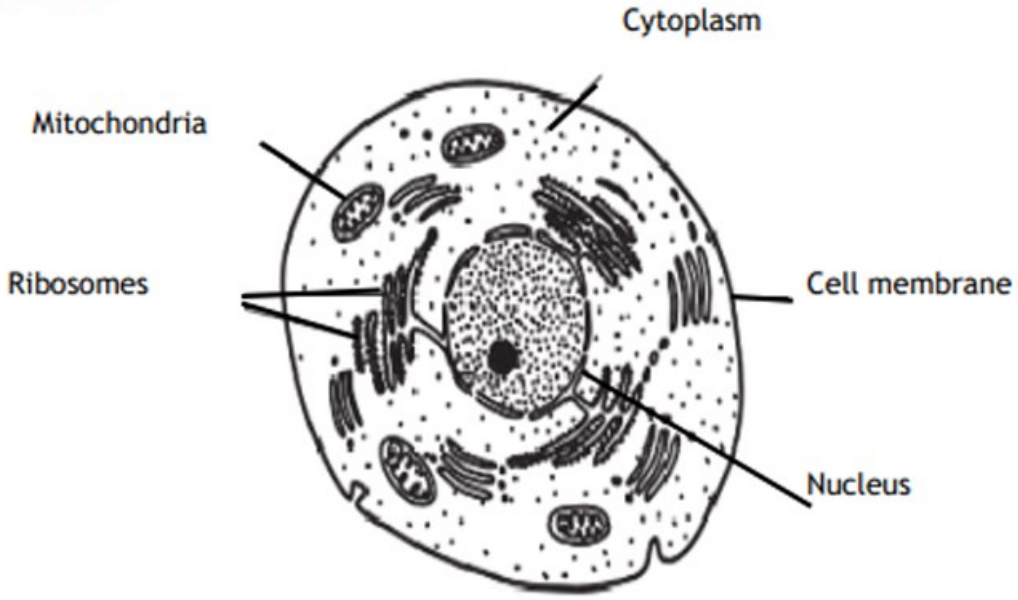
Cell Ultra Structure Revision

Animal Cell

5 key structures.



Mitochondria Numbers

Different types of specialised cells have different numbers of mitochondria.

Mitochondria Energy Requirement

The **higher the energy** requirement of the cell the **greater** the number of **mitochondria** present for **aerobic respiration.**

Example 1:
Muscle cells need lots of mitochondria to produce energy for **muscle contraction.**

Example 2:
Sperm cells need lots of mitochondria to produce energy for **movement.**

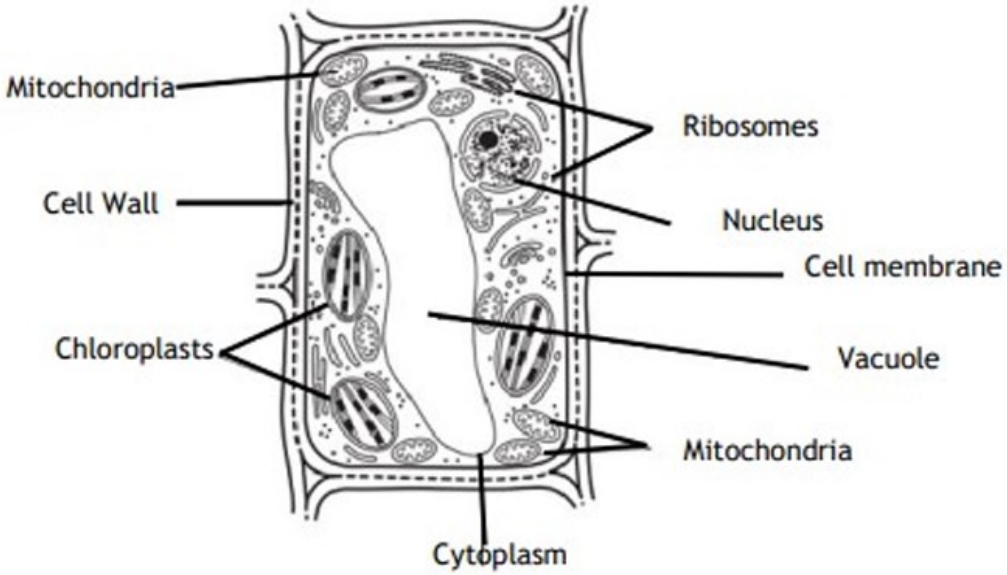
Cell Ultra Structure Revision

Plant Cell

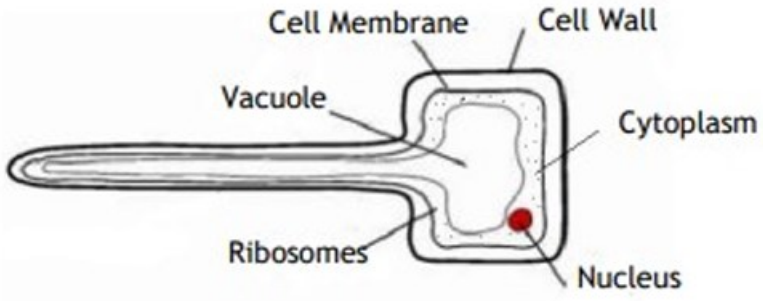
8 key structures.

Only Plant cell walls are made of **cellulose.**
Only green plant cells have chloroplasts.

Palisade Mesophyll Cells– Located in the leaf and contain chloroplasts for photosynthesis.



Root Hair Cells—Do not contain chloroplasts as there is no light for photosynthesis.

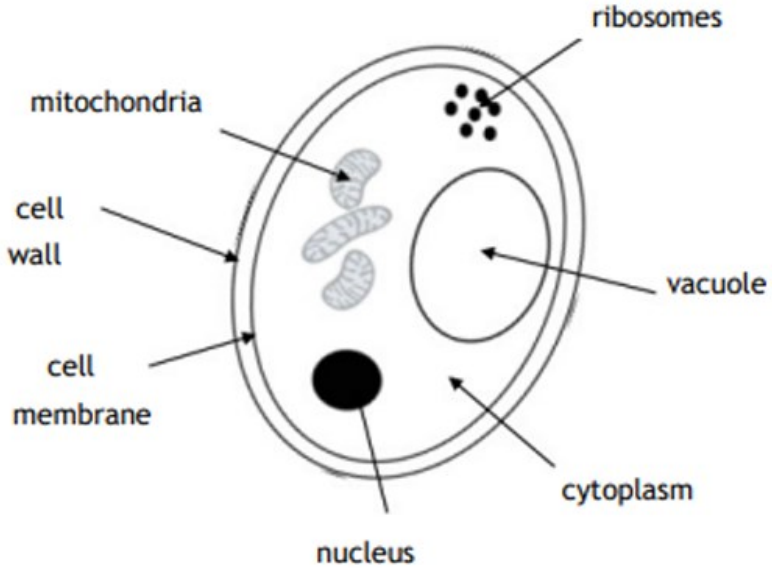


Cell Ultra Structure Revision

Fungal Cell (Yeast)

7 key structures.

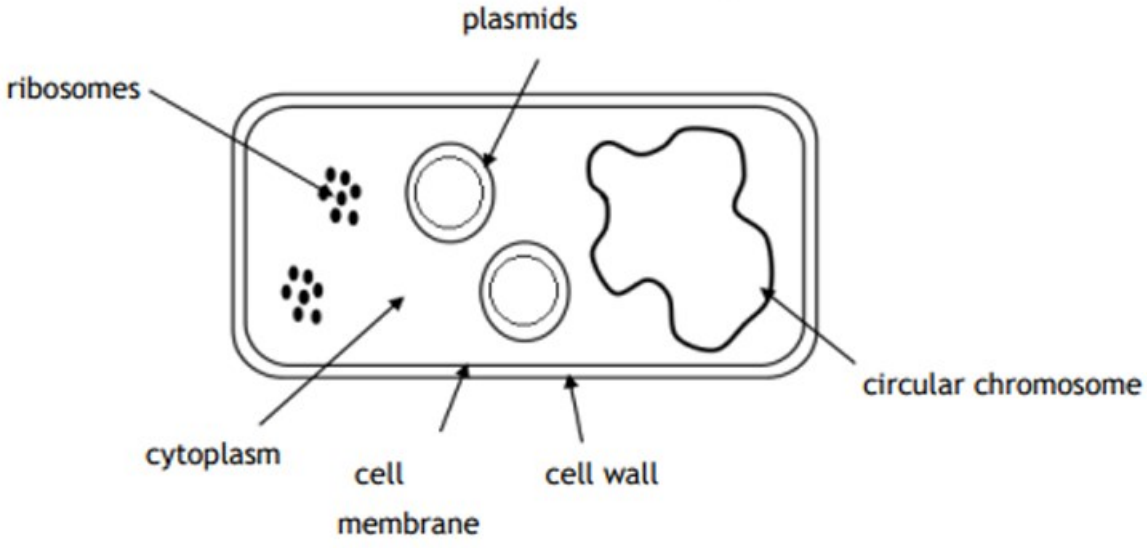
Identical structures to green plant cells except they do not have any **chloroplasts**
Their cell wall is NOT made of cellulose.



Bacterial Cell

6 key structures.

Absence of organelles e.g NO nucleus.
Their cell wall is NOT made of cellulose.



Cell Ultra Structure Revision

Organelle	Function	Location
Cell membrane	Controls movement of substances into and out of cell.	All cells
Cytoplasm	Where all chemical reactions occur.	All cells
Ribosome***	Where protein synthesis occurs.	All cells
Mitochondria***	Where **aerobic** respiration occurs.	Plant, animal and yeast
Nucleus	Controls all cell activities.	Plant, animal and yeast
Cell wall	Supports the cell.	Bacteria, yeast and plant
Vacuole	Stores cell sap.	Plant and yeast
Chloroplast	Where photosynthesis occurs.	Plant only

Similarities between Cells

All four cell types have the following cell parts;

1. Ribosomes
2. Cell Membrane
3. Nucleus

Differences between Cells

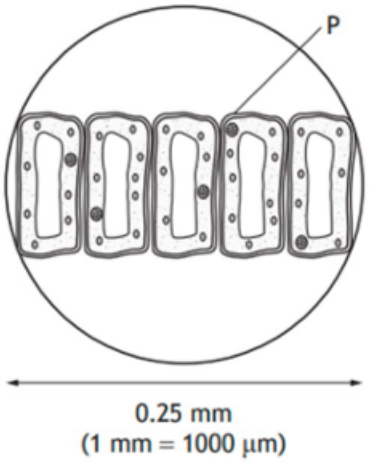
Model Answer

A **plant cell** has **chloroplasts** but an **animal cell** does not.

Numeracy: Calculating Cell size from Field of View

Calculating average cell size

Diagram



Cell Size Step 1

Field of view diameter
number of cells

0.25mm
5 cells = **0.05mm**

Cell size Step 2 (mm to µm)

Often these questions ask you to convert from mm to µm by **multiplying by 1000**

e.g. 0.05mm x 1000 = **500 µm**

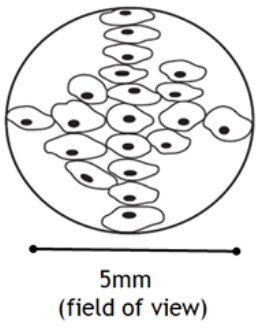
Harder Worked Example

Calculate the average cell length and breadth using the diagram below.

Average cell length;

5/5 cells = 1mm

1mm x 1000 = 1000 µm



Average cell breadth;

5/10 cells= 0.5 mm

0.5 mm x 1000 = 500 µm