

Cell structure

What are eukaryotic cells?

Cell structure

What are prokaryotic cells?

Cell structure

How is the genetic material arranged in a bacterial cell?

Cell structure

Give the prefixes centi, milli, micro and nano as powers of ten.

Cell structure

What is standard form?

Cell structure

List the parts found in most animal cells.

Cell structure

What extra parts do plant cells often have?

Cell structure

Function of the nucleus?

Bacterial cells. Much smaller than eukaryotic cells, with cytoplasm and a cell membrane surrounded by a cell wall. Genetic material is not enclosed in a nucleus.

Cells with genetic material enclosed in a nucleus, plus a cell membrane and cytoplasm. Plant and animal cells are eukaryotic.

Centi 10^{-2} , milli 10^{-3} , micro 10^{-6} , nano 10^{-9} .

As a single DNA loop, not enclosed in a nucleus. There may also be one or more plasmids.

Nucleus, cytoplasm, cell membrane, mitochondria and ribosomes.

A number between 1 and 10 multiplied by a power of ten, for example 3×10^{-4} .

Contains the genetic material (DNA) and controls the activities of the cell.

Chloroplasts and a permanent vacuole filled with cell sap. Plant and algal cells also have a cell wall made of cellulose.

Cell structure

Function of mitochondria?

Cell structure

Function of ribosomes?

Cell structure

Function of chloroplasts?

Cell structure

Function of the cell membrane?

Cell structure

Function of the cell wall in plants and algae?

Cell structure

When should you use estimation to compare sub-cellular structures?

Cell structure

Required practical 1: which lens do you start with and why?

Cell structure

Required practical 1: what must a drawing include?

Where proteins are made (protein synthesis).

Where aerobic respiration takes place, releasing energy for the cell.

Controls the movement of substances into and out of the cell.

They contain chlorophyll and absorb light energy for photosynthesis.

When you only need to judge relative size or area, by rounding the measurements to easy numbers.

Made of cellulose. It strengthens the cell.

Clear labels, a title and a magnification scale, drawn in sharp pencil with no shading.

The lowest-power objective lens, to find the specimen and avoid the lens hitting the slide.

Cell structure

How is a sperm cell adapted for its function?

Cell structure

How is a nerve cell adapted for its function?

Cell structure

How is a muscle cell adapted for its function?

Cell structure

How is a root hair cell adapted for its function?

Cell structure

How is a xylem cell adapted for its function?

Cell structure

How is a phloem cell adapted for its function?

Cell structure

What is cell differentiation?

Cell structure

Why is differentiation important?

It is long to carry impulses over long distances, and has branched connections at the ends to connect with other cells.

Tail to swim, many mitochondria for energy, streamlined head, and enzymes in the head to get into the egg.

Long hair-like projection gives a large surface area to absorb water and mineral ions. Many mitochondria release energy for active transport.

Protein fibres that shorten to contract the cell, and many mitochondria to release energy for contraction.

Elongated cells joined end to end into tubes. Pores in the end walls let cell sap with dissolved sugars move from cell to cell.

Forms a hollow tube with no end walls, and strengthened walls, to carry water and mineral ions up the plant.

It lets cells become specialised so they can carry out specific functions efficiently in a multicellular organism.

The process by which cells acquire different sub-cellular structures to carry out a particular function, becoming specialised.

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When do most animal cells differentiate, compared with plant cells?

Cell structure

What is cell division mainly used for in mature animals?

Cell structure

Why does an electron microscope show more detail than a light microscope?

Cell structure

What is resolving power?

Cell structure

What is the magnification equation?

Cell structure **Triple only**

How do bacteria reproduce?

Cell structure **Triple only**

How can bacteria be grown in the laboratory?

Cell structure **Triple only**

Why must Petri dishes and culture media be sterilised?

Repair and replacement.

Most animal cells differentiate at an early stage. Many plant cells keep the ability to differentiate throughout life.

The ability to distinguish between two points that are close together as separate points.

It has much higher magnification and resolving power.

By simple cell division called binary fission, as often as once every 20 minutes with enough nutrients and a suitable temperature.

Magnification = size of image ÷ size of real object.

To kill unwanted microorganisms and stop contamination.

In a nutrient broth solution, or as colonies on an agar gel plate.

Cell structure **Triple only**

Why is an inoculating loop passed through a flame?

Cell structure **Triple only**

Why is the lid of the Petri dish taped on and stored upside down?

Cell structure **Triple only**

Why are school cultures incubated at 25 °C?

Cell structure **Triple only**

How do you find the number of bacteria after a given time?

Cell structure **Triple only** **Higher tier**

Higher tier: how do you give a very large bacterial count in standard form?

Cell structure **Triple only**

What is a zone of inhibition?

Cell structure **Triple only**

How do you calculate the area of a clear zone?

Tape stops microorganisms getting in or out. Upside down stops condensation dripping onto the culture.

To sterilise it, so only the intended microorganisms are transferred.

Divide total time by division time to get the number of divisions, then starting number $\times 2$ to the power of divisions.

To prevent the growth of pathogens that are harmful to humans.

The clear area around an antiseptic or antibiotic disc where bacteria have not grown. Bigger zone means more effective.

Write a number between 1 and 10 $\times$ a power of ten, for example $16\,777\,216 = 1.7 \times 10^7$ (2 s.f.).

Area = πr^2 , where the radius is half the diameter.