

CAIE Biology IGCSE

2 - Organisation of the Organism

Flashcards

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State 3 parts of an animal cell visible under a light microscope



State 3 parts of an animal cell visible under a light microscope

Nucleus, cytoplasm and the cell membrane



State 2 **additional** features of eukaryotic cells that are not visible under a light microscope



State 2 **additional** features of eukaryotic cells that are not visible under a light microscope

- Ribosomes
- Mitochondria



What is the function of ribosomes?



What is the function of ribosomes?

Ribosomes are the site of protein synthesis



What is the function of the mitochondria?



What is the function of the mitochondria?

The mitochondria is the powerhouse of the cell. It produces energy in the form of ATP by carrying out aerobic respiration.



A very metabolically active cell is likely to have lots of which type of organelle?

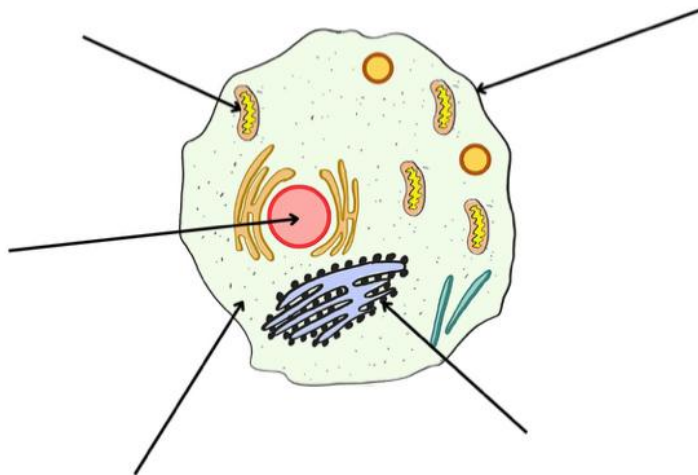


A very metabolically active cell is likely to have lots of which type of organelle?

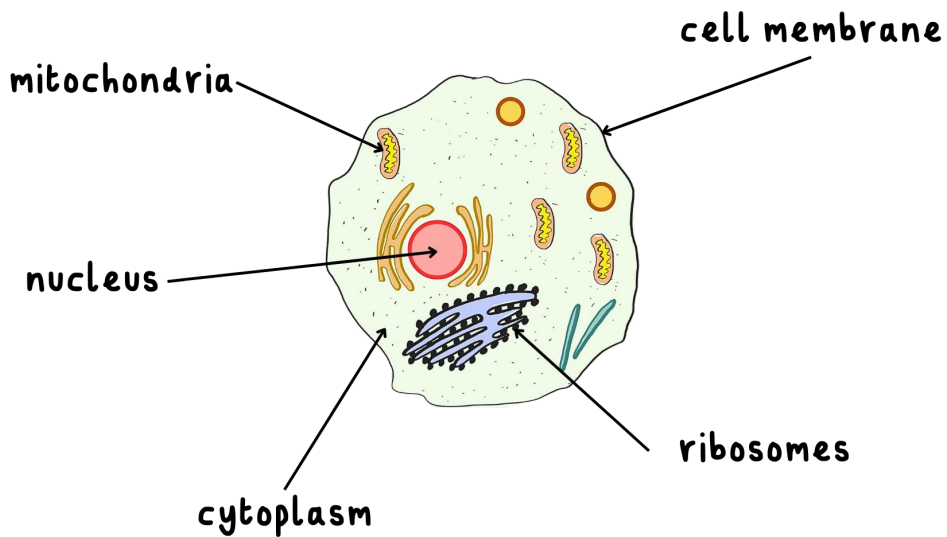
Mitochondria as they produce energy through aerobic respiration



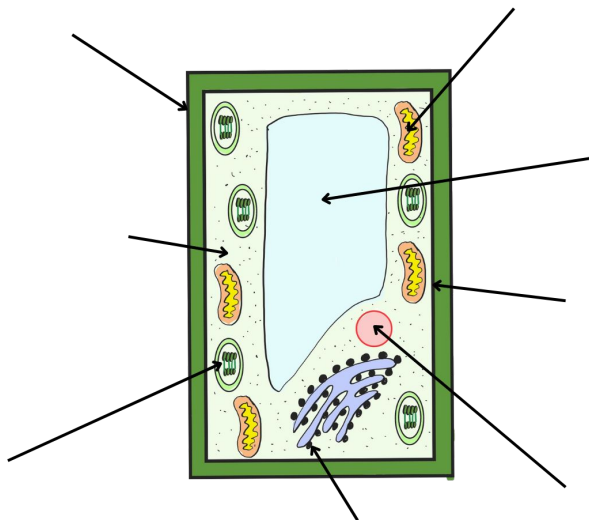
Label this animal cell



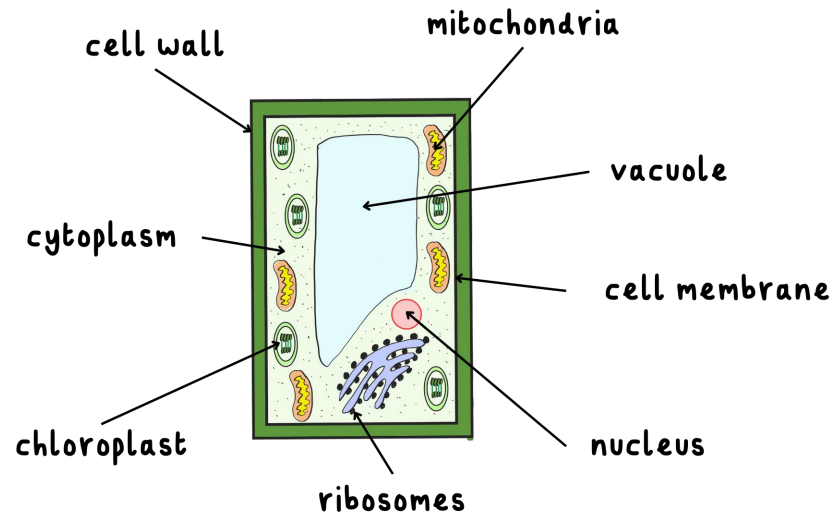
Label this animal cell



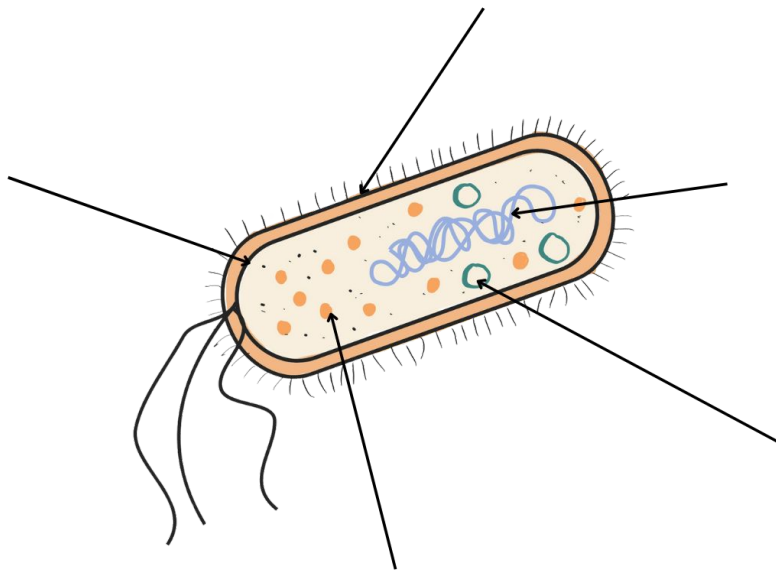
Label this plant cell



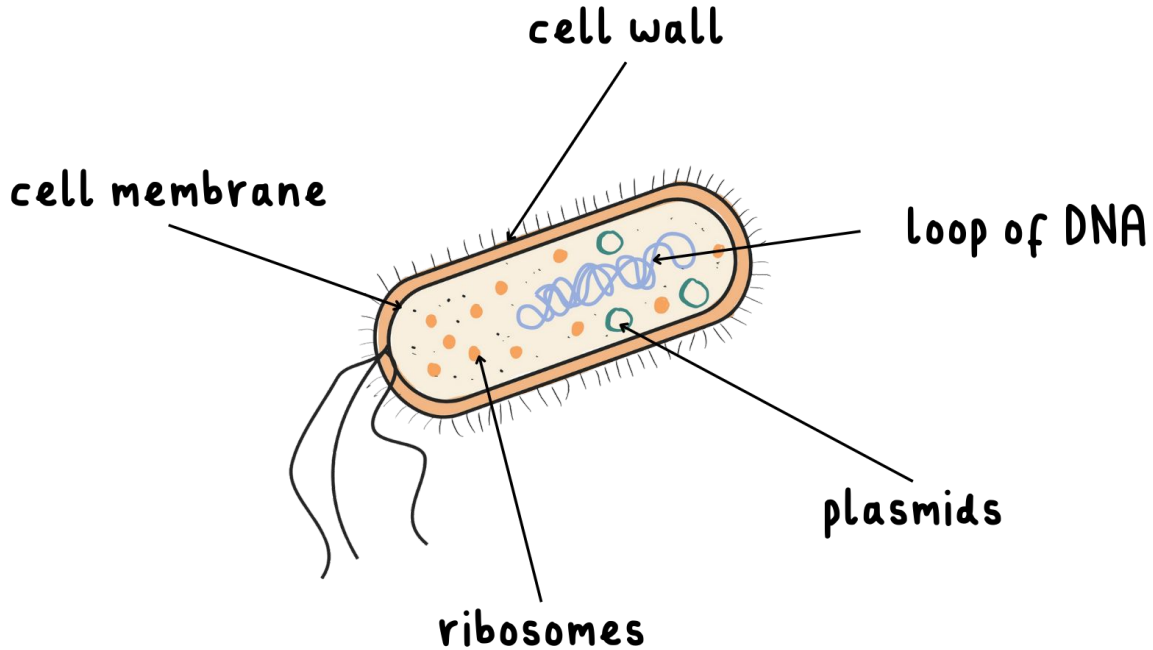
Label this plant cell



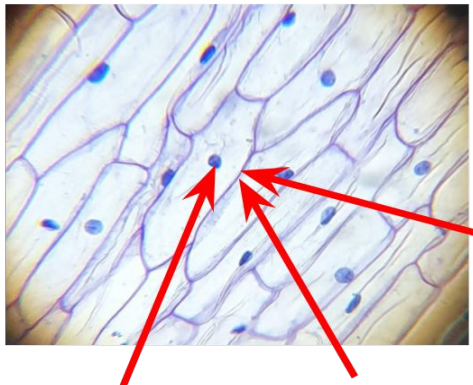
Label this bacterial cell



Label this bacterial cell



Label this light micrograph of an onion epidermal cell



(On the inside)

(On the outside)



Label this light micrograph of an onion epidermal cell



Nucleus

Cell wall
(On the
outside)

Cell
membrane
(On the
inside)



State 6 parts of a plant cell visible under
a light microscope



State 6 parts of a plant cell visible under a light microscope

Nucleus, cytoplasm, chloroplasts, vacuoles, cell wall and the cell membrane



State the organelles that a bacterial cell contains



State the organelles that a bacterial cell contains

Cell wall, cell membrane, cytoplasm,
circular DNA, plasmids and ribosomes



State 2 functions of the nucleus



State 2 functions of the nucleus

- Controls the cell
- Contains genetic material - found in the form of chromosomes



State the function of the cytoplasm



State the function of the cytoplasm

It is where most of the cell's chemical reactions take place



State 3 organelles only found in plant cells



State 3 organelles only found in plant cells

- Cellulose cell wall
- Permanent vacuole
- Chloroplasts



What is the function of the cell wall and what is it made of?



What is the function of the cell wall and what is it made of?

It provides strength and support. It is made of cellulose (in plants).



What is the function of the permanent vacuole and what does it contain?



What is the function of the permanent vacuole and what does it contain?

It supports the cell and contains cell sap (a solution of sugars and salts)



What is the function of chloroplasts?



What is the function of chloroplasts?

They are the site of photosynthesis



State 2 organelles only found in bacterial cells



State 2 organelles only found in bacterial cells

- Circular DNA
- Plasmids



What is the function of plasmids?



What is the function of plasmids?

Contain extra genes in addition to those in the circular DNA



What is the function of ciliated epithelial cells?



What is the function of ciliated epithelial cells?

They waft away mucus, dirt and debris up the throat where it can be swallowed

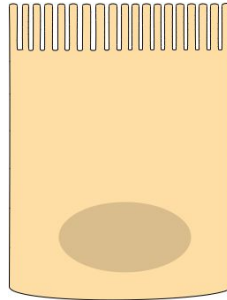


How are ciliated epithelial cells adapted to their function?



How are ciliated epithelial cells adapted to their function?

- Small cilia that line the exposed surface can waft back and forwards
- The cilia are long and thin so that lots of them can waft at the same time



What is the function of root hair cells?



What is the function of root hair cells?

To take up minerals and water needed
by the plant

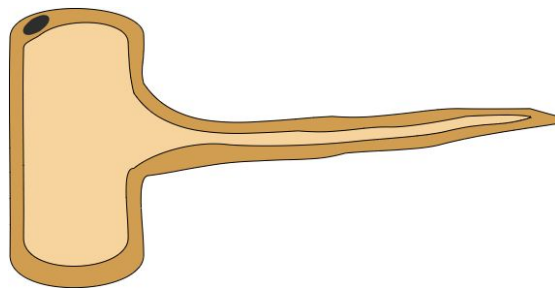


How are root hair cells adapted to their function?



How are root hair cells adapted to their function?

- They have lots of mitochondria to provide energy for active transport
- They have a long extension to maximise the surface area available for uptake



What is the function of palisade mesophyll cells?



What is the function of palisade mesophyll cells?

Their main function is to absorb light and carry out photosynthesis

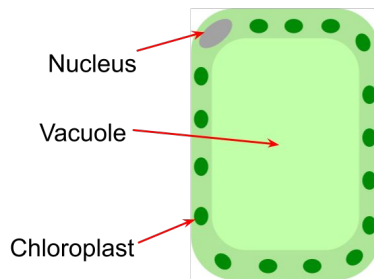


How are palisade mesophyll cells adapted to their function?



How are palisade mesophyll cells adapted to their function?

- Contain lots of chloroplasts to carry out photosynthesis
- Thin and tall so that many can be packed together
- Large vacuole pushes chloroplasts to the outside of the cell
- Thin cell wall to minimise the diffusion distance



What is the function of red blood cells?



What is the function of red blood cells?

Red blood cells carry oxygen from the lungs to tissues and carbon dioxide from tissues to the lungs to be exhaled

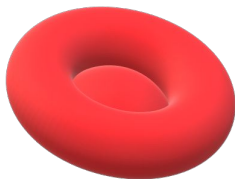


How are red blood cells adapted to their function?



How are red blood cells adapted to their function?

- No nucleus so there is more room for haemoglobin
- Contain lots of haemoglobin to carry oxygen
- Biconcave shape giving a large surface area to volume ratio
- Thin membrane to minimise the diffusion distance for gases



What is the function of neurones?



What is the function of neurones?

To pass electrical impulses quickly from one part of the body to another

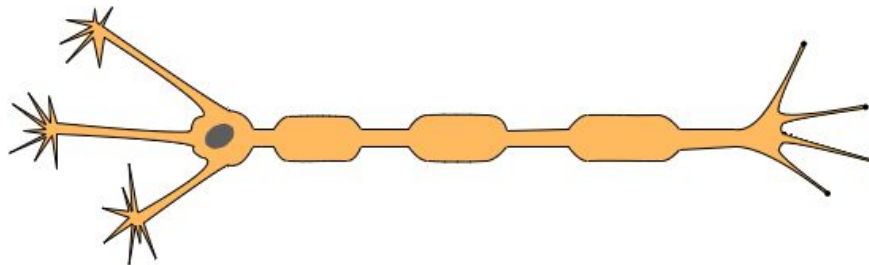


How are neurones adapted to their function?



How are neurones adapted to their function?

- Ends contain neurotransmitters to send impulses to other neurones
- Long axon to transmit impulses long distances
- Thin to transmit impulses faster
- Enclosed in a myelin sheath to speed up transmission



What is the function of a sperm cell?



What is the function of a sperm cell?

To travel to, penetrate and fertilise an egg cell

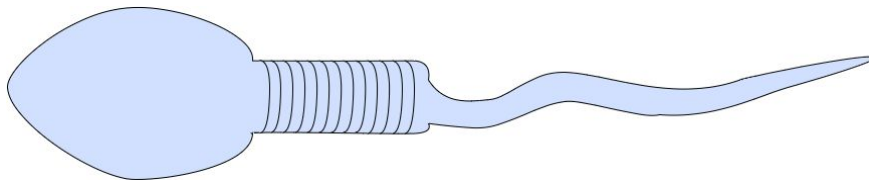


How are sperm cells adapted to their function?



How are sperm cells adapted to their function?

- They contain a long tail to help it swim to the egg
- They have a middle section containing lots of mitochondria which provide the cell with energy for swimming to the egg
- They have an acrosome at the tip containing enzymes to digest the outer membrane of the egg



What is the function of an egg cell?



What is the function of an egg cell?

To fuse with a sperm cell for reproduction

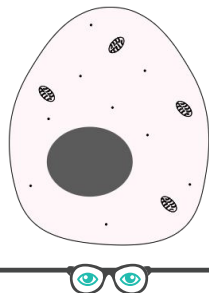


How is an egg cell adapted to its function?



How is an egg cell adapted to its function?

- Haploid nucleus so that after fusing with a sperm it produces a diploid organism
- Lots of cytoplasm for many divisions
- Lots of nutrients to support the egg until it reaches the womb



Define cell



Define cell

Basic building block of all living organisms



Define tissue



Define tissue

A group of cells working together to carry out a specific function



Define organ



Define organ

A group of tissues working together to carry out a specific function



Define organ system



Define organ system

A group of organs working together to carry out a specific function



Name 3 organ systems in the body



Name 3 organ systems in the body

- The respiratory system
- The circulatory system
- The reproductive system

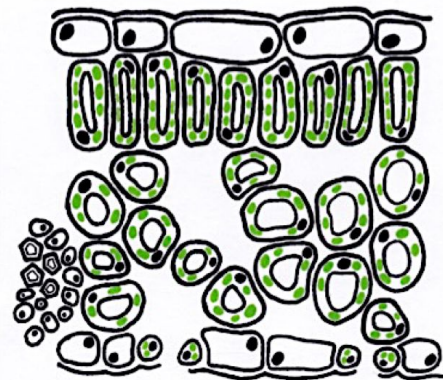


What tissues make up a plant leaf?



What tissues make up a plant leaf?

- Mesophyll tissue (spongy mesophyll and palisade mesophyll)
- Epidermis (upper and lower)
- Veins (xylem and phloem)



What organs make up the circulatory system?



What organs make up the circulatory system?

- The heart
- The lungs
- The blood vessels



What type of tissue is the heart made up of?



What type of tissue is the heart made up of?

Cardiac muscle



What organs make up the digestive system?

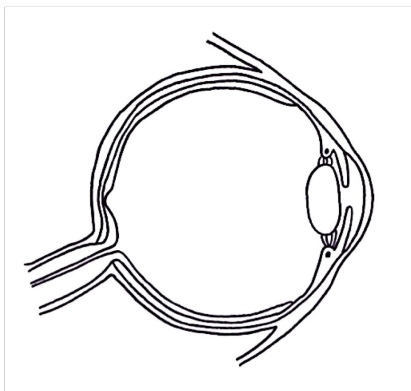


What organs make up the digestive system?

The oesophagus, stomach, small intestine, large intestine, liver, pancreas, gallbladder and anus



Is this diagram an example of a tissue, organ or organ system?

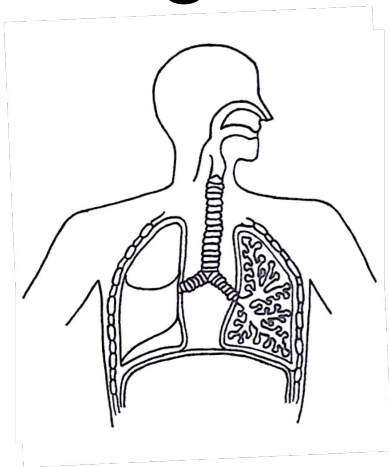


Is this diagram an example of a tissue, organ or organ system?

This is an organ (the eye) which is made of multiple different tissues



Is this diagram an example of a tissue, organ or organ system?

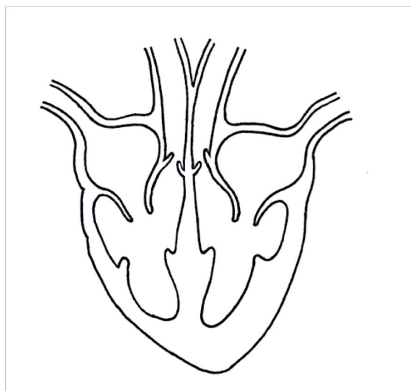


Is this diagram an example of a tissue, organ or organ system?

This is an organ system (the respiratory system) which is made of multiple different organs working together



Is this diagram an example of a tissue,
organ or organ system?

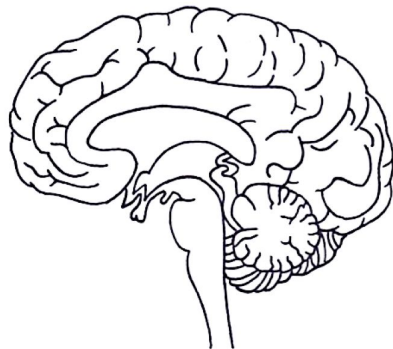


Is this diagram an example of a tissue, organ or organ system?

This is an organ (the heart) which is made of multiple different tissues



Is this diagram an example of a tissue,
organ or organ system?

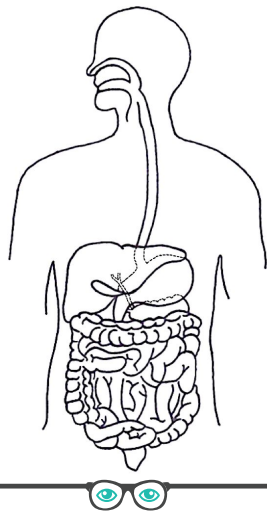


Is this diagram an example of a tissue, organ or organ system?

This is an organ (the brain) which is made of multiple different tissues



Is this diagram an example of a tissue,
organ or organ system?



Is this diagram an example of a tissue, organ or organ system?

This is an organ system (the digestive system) which is made of multiple different organs working together



Define magnification



Define magnification

How much larger a displayed image is compared with the original object



What is the formula to calculate magnification from image size and actual size?



What is the formula to calculate magnification from image size and actual size?

(The I AM formula)

Image size = Actual Size x Magnification



If a cell with an actual size of 0.05mm in diameter is viewed under a microscope with a $200\times$ power lens, what will the size of the image be in mm?



If a cell with an actual size of 0.05mm in diameter is viewed under a microscope with a 200x power lens, what will the size of the image be in mm?

Actual size = 0.05mm

Magnification = 200x

$I = A \times M$

$0.05 \times 200 = 10\text{mm}$



If an image of a cell is 50mm in diameter when viewed under a 800x microscope, what is the size of the actual cell in mm?



If an image of a cell is 50mm in diameter when viewed under a 800x microscope, what is the size of the actual cell in mm?

Image size = 50mm

Magnification = 800x

$I = A \times M$ can be rearranged to $I / M = A$

$50/800 = 0.0625\text{mm}$



How do you convert from mm to cm?



How do you convert from mm to cm?

Divide by 10

E.g. $100 \text{ mm} = 10 \text{ cm}$



How do you convert from cm to mm?



How do you convert from cm to mm?

Multiply by 10

E.g. $5 \text{ cm} = 50 \text{ mm}$



How do you convert from mm to μm ?
(Higher/Supplement)



How do you convert from mm to μm ?
(Higher/Supplement)

Multiply by 1000

E.g. $50\text{mm} = 50,000\mu\text{m}$



How do you convert from μm to mm ?
(Higher/Supplement)



How do you convert from μm to mm ?
(Higher/Supplement)

Divide by 1000

E.g. $6\mu\text{m} = 0.006\text{mm}$

