CIE Biology IGCSE

2 - Organisation of the Organism

Flashcards

State 4 parts of an animal cell visible under a light microscope

State 4 parts of an animal cell visible under a light microscope

Nucleus, cytoplasm and the cell membrane

State 4 **additional** features of eukaryotic cells that are not visible under a light microscope (Higher/Supplement)

State 4 **additional** features of eukaryotic cells that are not visible under a light microscope (Higher/Supplement)

- Ribosomes
- Mitochondria
- Rough endoplasmic reticulum
- Vesicles

What is the function of ribosomes? (Higher/Supplement)

What is the function of ribosomes? (Higher/Supplement)

Ribosomes are the site of protein synthesis

What is the function of the rough endoplasmic reticulum? (Higher/Supplement)

What is the function of the rough endoplasmic reticulum? (Higher/Supplement)

The rough endoplasmic reticulum is studded with ribosomes and is involved in producing and transporting proteins.

What is the function of the mitochondria? (Higher/Supplement)

What is the function of the mitochondria? (Higher/Supplement)

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

What is the function of vesicles? (Higher/Supplement)

What is the function of vesicles? (Higher/Supplement)

Vesicles are used to transport substances within cells

A very metabolically active cell is likely to have lots of which type of organelle? (Higher/Supplement)

A very metabolically active cell is likely to have lots of which type of organelle? (Higher/Supplement)

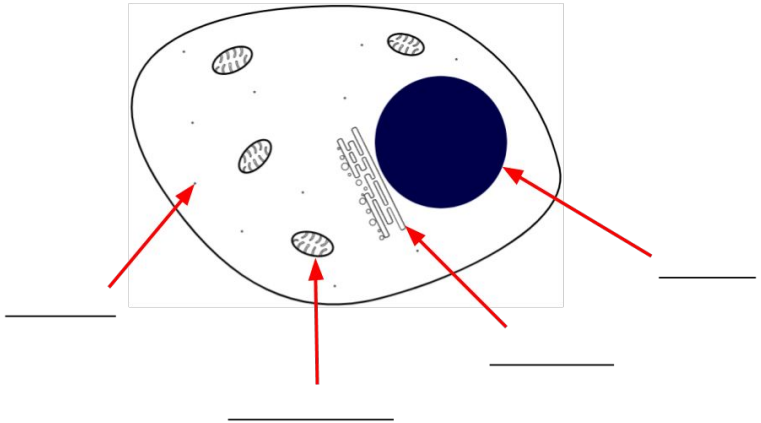
Mitochondria as they produce energy through aerobic respiration

What types of cells have rough endoplasmic reticulum and mitochondria? (Higher/Supplement)

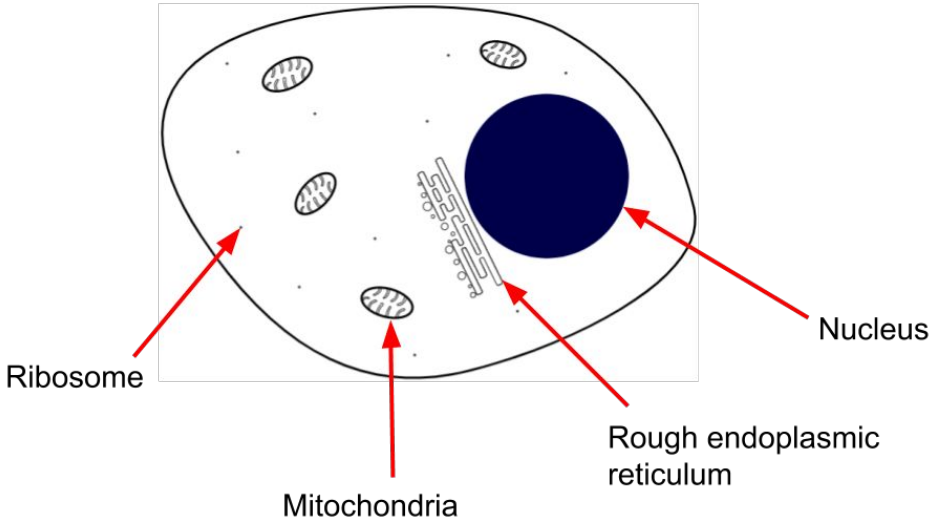
What types of cells have rough endoplasmic reticulum and mitochondria? (Higher/Supplement)

Almost all cells except prokaryotic cells like bacteria

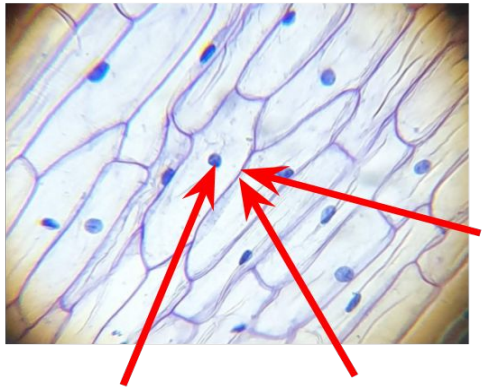
Label this cell diagram (Higher/Supplement)



Label this cell diagram (Higher/Supplement)



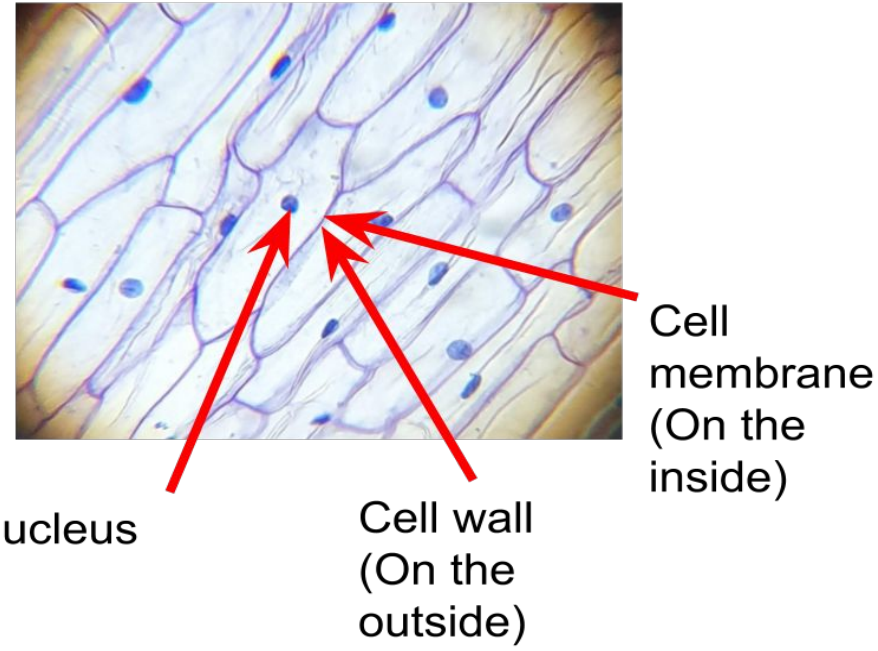
Label this light micrograph of an onion epidermal cell



_____ (On the inside)

_____ (On the outside)

Label this light micrograph of an onion epidermal cell



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 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 the function of ribosomes

State the function of ribosomes

They are the site of protein synthesis

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

What is the function of ciliated epithelial cells?

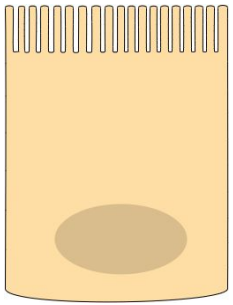
What is the function of ciliated epithelial cells?

They waft away 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?

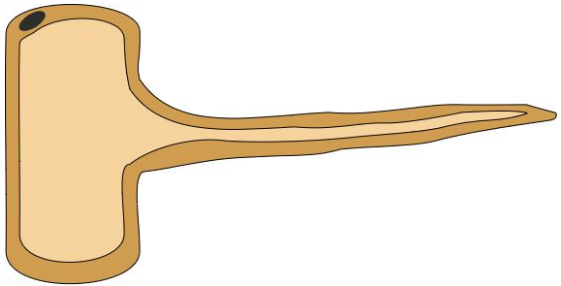
What is the function of root hair cells?

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 xylem vessels?

What is the function of xylem vessels?

To transport water from the roots to the shoots and to support the plant

How are xylem vessels adapted to their function?

How are xylem vessels adapted to their function?

- Waterproofed and strengthened with a substance called lignin
- Small diameter so a continuous column of water is maintained
- Dead cells without organelles so that the flow of water is not interrupted

What is the function of palisade mesophyll cells?

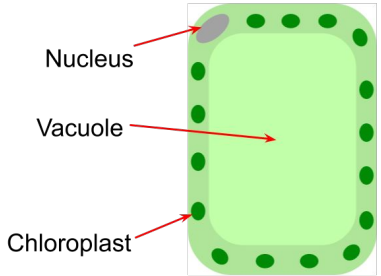
What is the function of palisade mesophyll cells?

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?

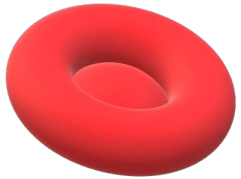
What is the function of red blood cells?

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 nerve cells?

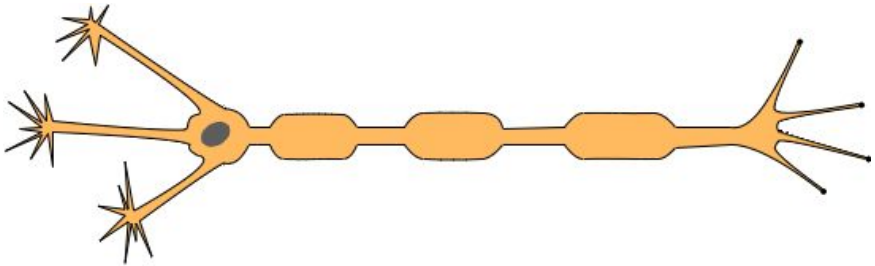
What is the function of nerve cells?

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

How are nerve cells adapted to their function?

How are nerve cells 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?

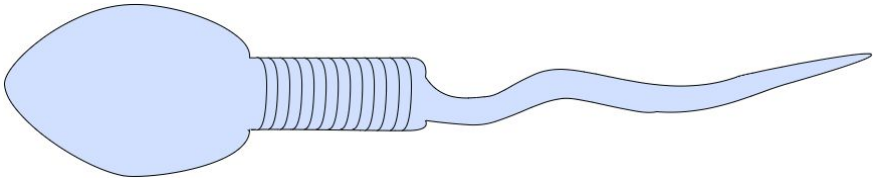
What is the function of a sperm cell?

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?

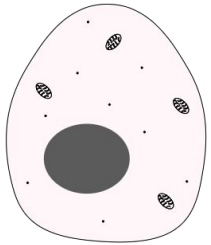
What is the function of an egg cell?

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 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

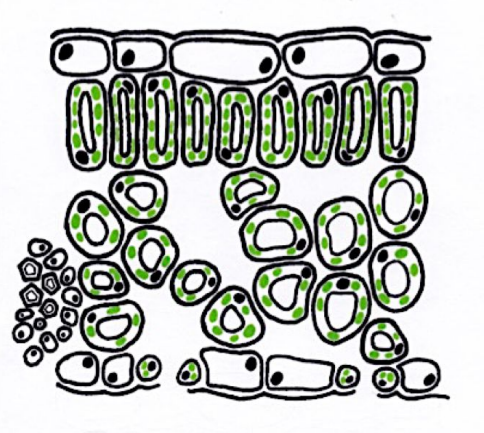
What tissues make up a plant leaf?

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?

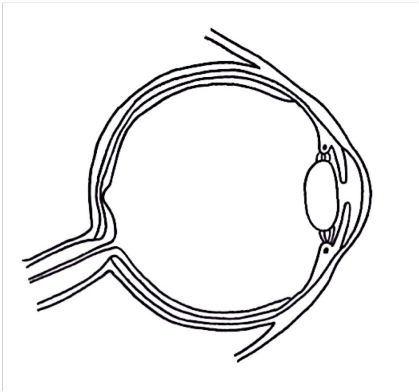
Cardiac muscle

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

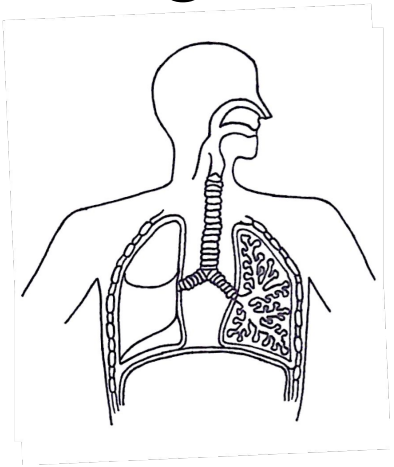
Is this diagram an example of a tissue, organ or organ system?



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

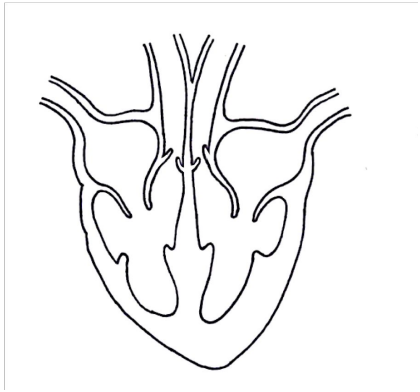
Is this diagram an example of a tissue, organ or organ system?



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

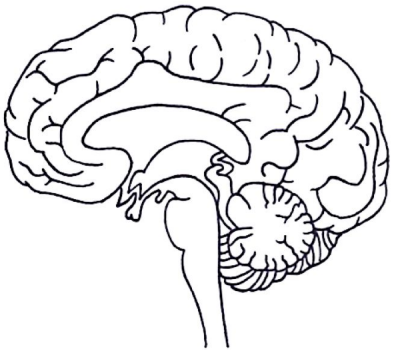
Is this diagram an example of a tissue, organ or organ system?



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

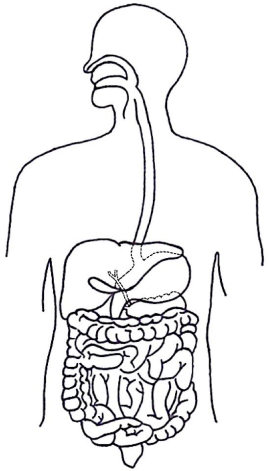
Is this diagram an example of a tissue, organ or organ system?



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

If a cell that is 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 x M

0.05 x 200 = 10mm

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 x M can be rearranged to I / M = A

50/800 = 0.0625mm

How do you convert from mm to cm?

How do you convert from mm to cm?

Divide by 10

E.g. 100 mm = 10 cm

How do you convert from cm to mm?

How do you convert from cm to mm?

Multiply by 10

E.g. 5 cm = 50 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. 50mm = 50,000μm

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. 6μm = 0.006mm