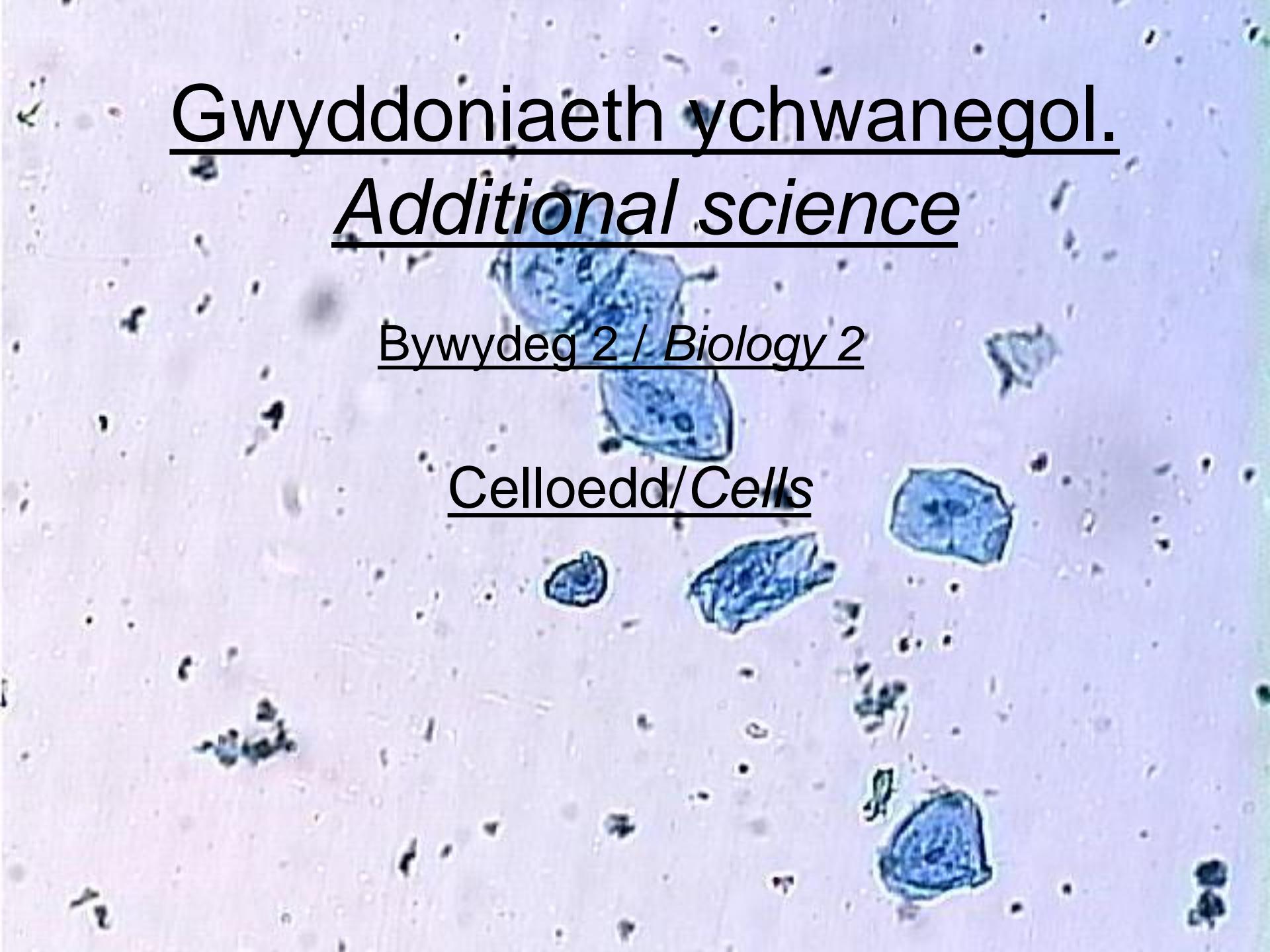


Gwyddoniaeth ychwanegol.

Additional science

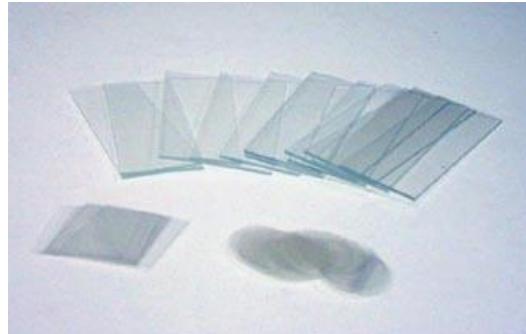
Bywydeg 2 / Biology 2

Celloedd/Cells



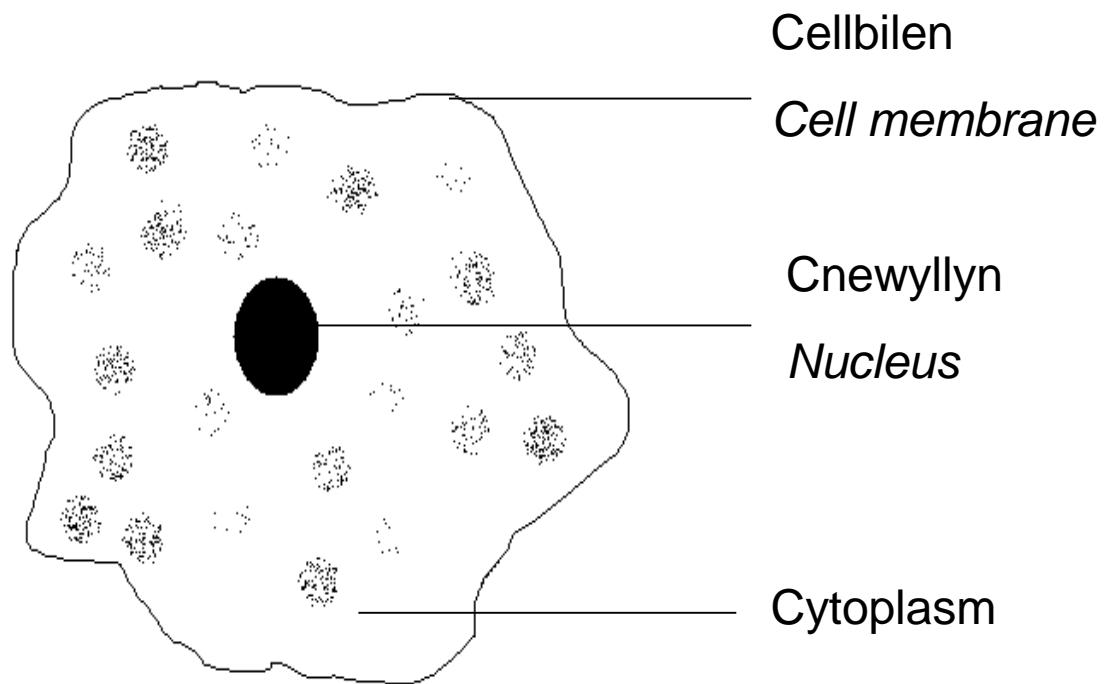
Edrych ar gelloedd boch/ Looking at cheek cells

- Byddwch angen / You'll need
- Microscope
- Methylene blue
- Sleid a gorchydd / Slide and coverslip
- Bys glân / Clean finger



Gnewch ddiagram o'r hyn ydych yn
ei weld a'i labelu.

*Draw a diagram of what you see and
label it.*



Gwaith rhannau'r gell anifail

Function of animal cell parts

Cnewyllyn

Cynnwys y gwybodaeth genetig ac yn rheoli'r gell.

Nucleus

Contains the genetic information and controls the cell

Pilen y gell

Rheoli beth sy'n mynd i fewn ac allan o'r gell.

Cell membrane

Controls what moves in and out of the cell.

Cytoplasm

Yma mae prosesau cemegol y gell yn digwydd.

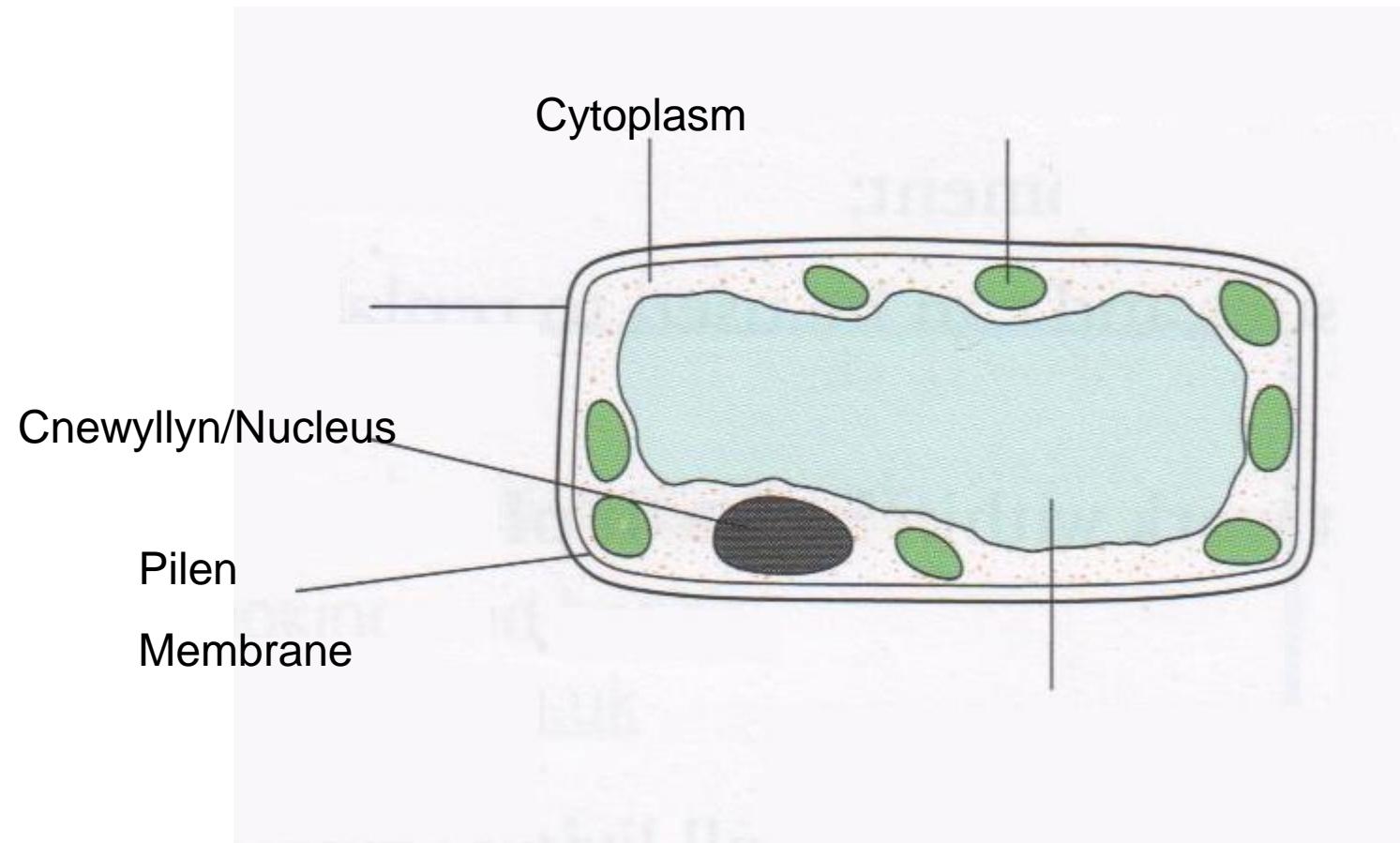
This is where the chemical processes of the cell occur

Cell planhigyn

Plant cell

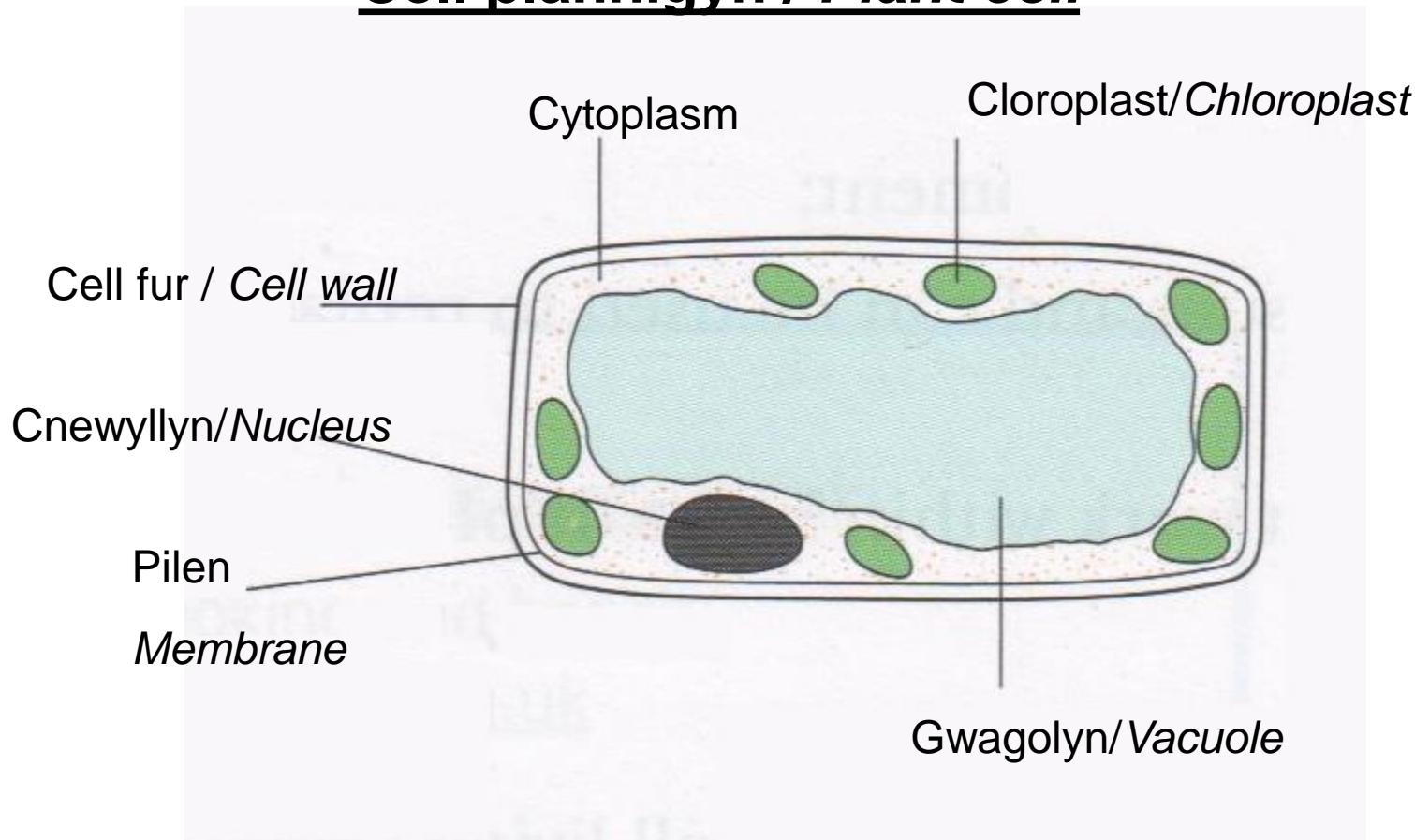
Mae'r Cnewyllyn, Cytoplasm a Pilen y gell yr un peth a'r gell anifail.

The Nucleus, Cytoplasm and Membrane are the same as an animal cell.



Ond mae 3 rhan yn ychwanegol. / But there are 3 extra parts

Cell planhigyn / Plant cell



Copiwch hwn i'ch llyfrau a'i ddysgu!

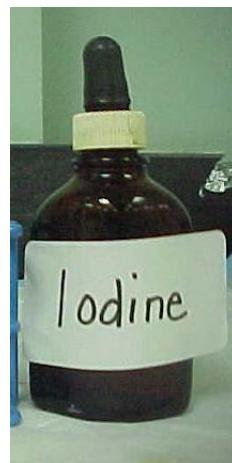
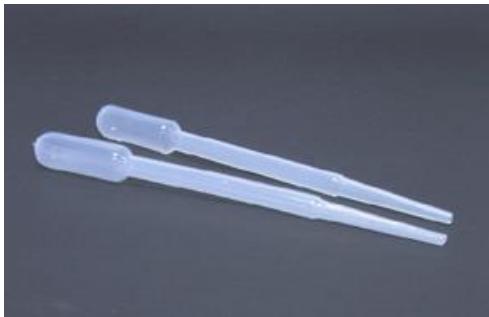
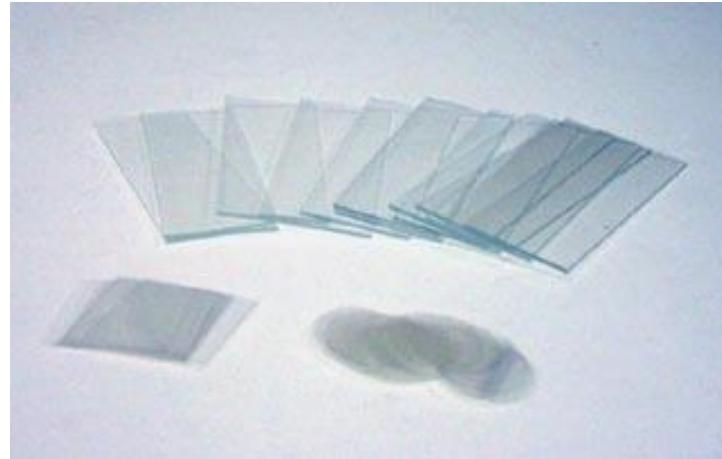
Copy this into your books and learn!

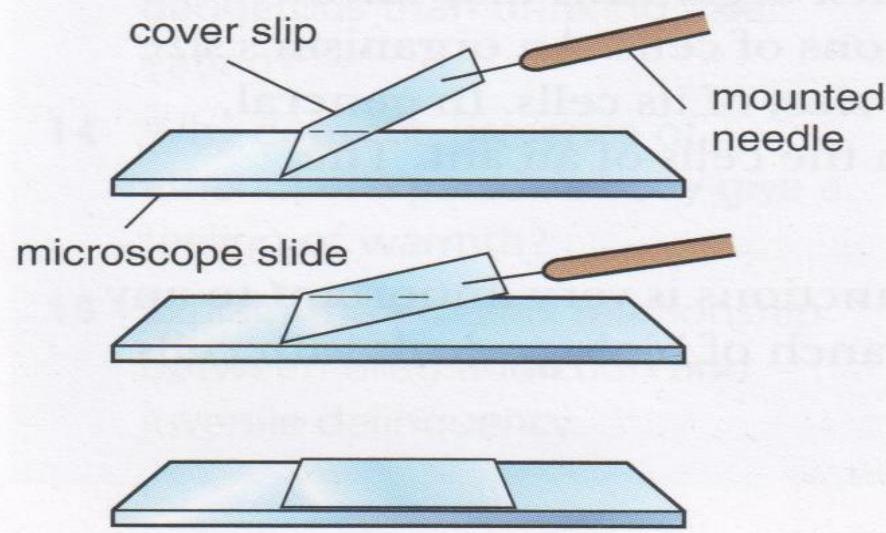
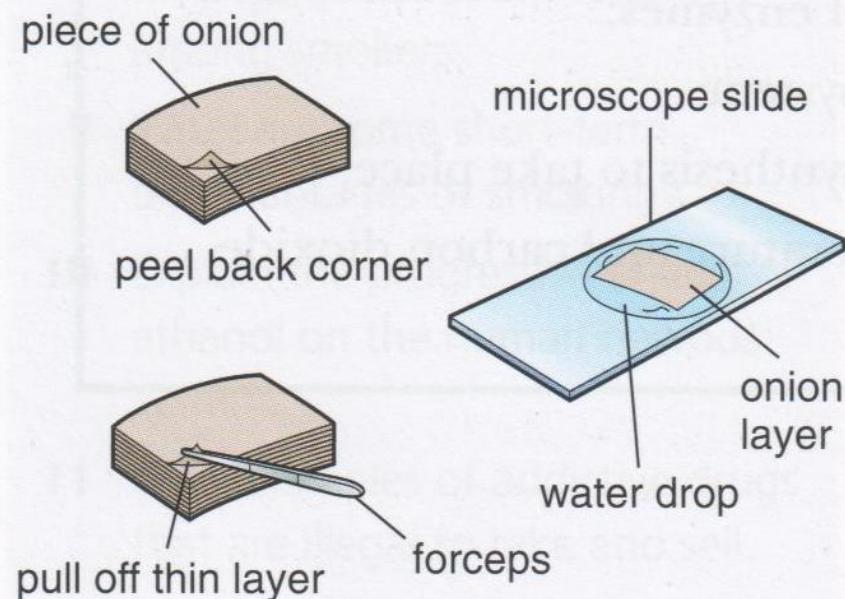
Edrych ar gelloedd planhigyn

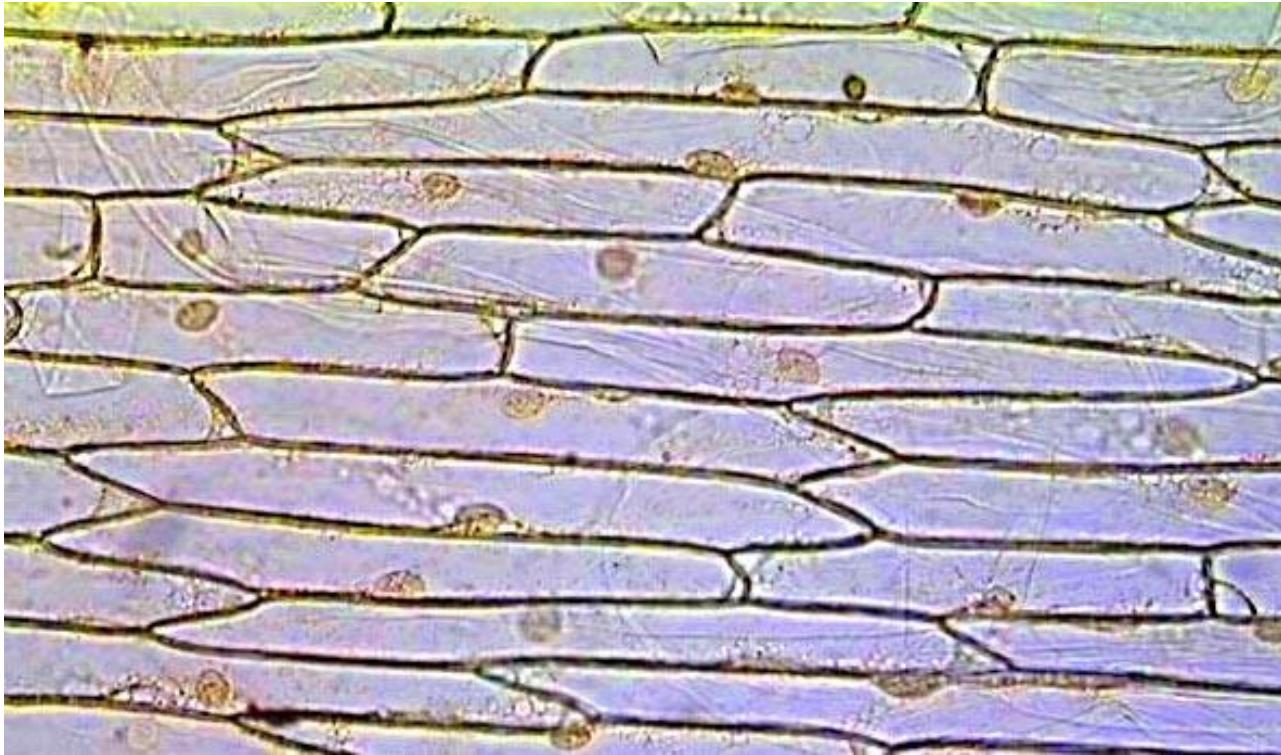
Looking at plant cells

Byddwch angen:-

You will need:-

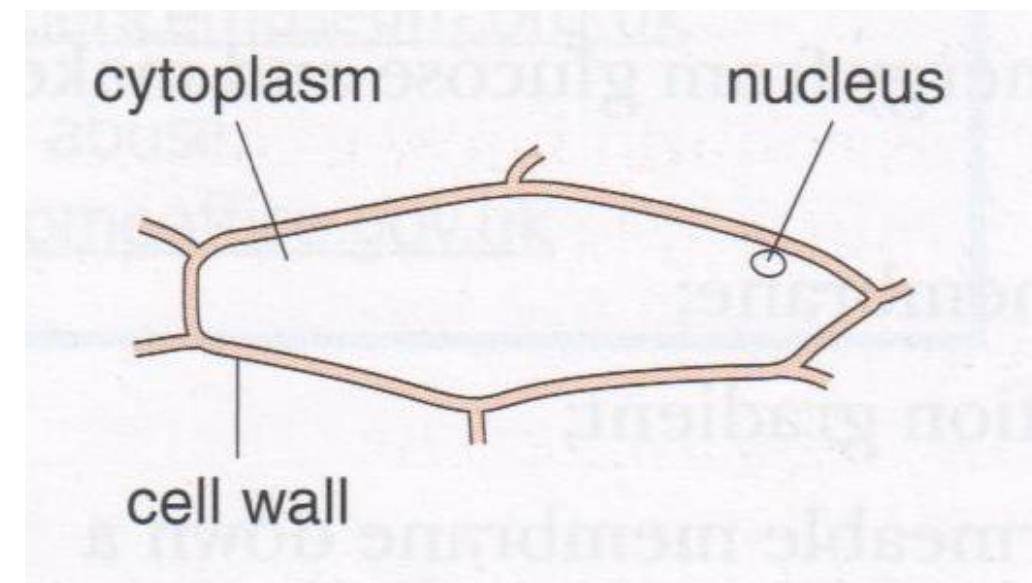






**Gnewch ddiagram
o'r hyn rydych yn ei
weld a'i labelu.**

*Draw a diagram of
what you see and
label it.*



Gwaith rhannau cell planhigyn

Function of plant cell parts

Cloroplast / Chloroplast

Disgiau gwyrdd sy'n cynnwys Cloroffyl. Creu bwyd I'r planhigyn trwy Ffotosynthesis.

Green discs that contain Chlorophyll. Makes food for plant using Photosynthesis

Cell Fur / Cell wall

Creu siap pendant i'r gell.

Gives the cell its definite shape

Gwagolyn / Vacuole

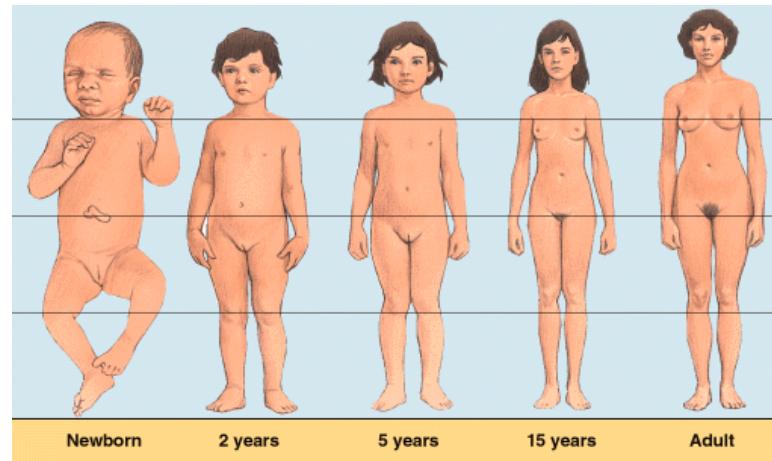
Llawn cell nodd. Yma mae'r gell yn storio sylweddau fel glwcos

Full of cell sap. This is where the plant cell stores substances such as Glucose

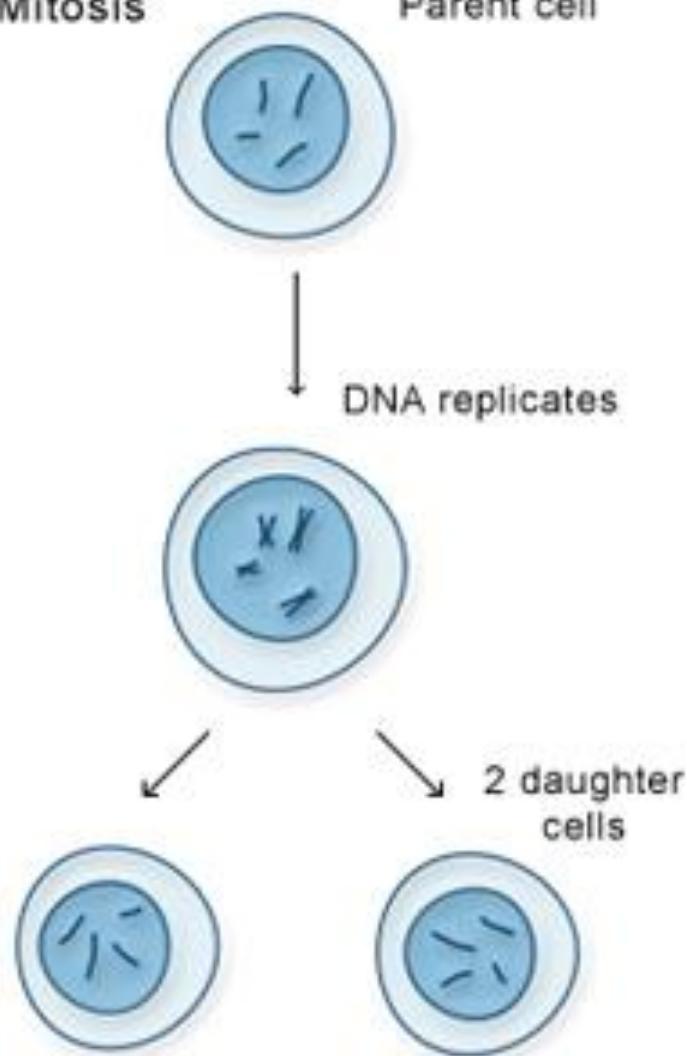
Copiwrch a'i gwblhau gyda tic neu groes
Copy and complete with a tick or cross

Enw/Name	Cell anifail <i>Animal cell</i>	Cell planhigyn <i>Plant cell</i>
Cnewyllyn/ Nucleus		
Cytoplasm		
Pilen/ Membrane		
Cloroplast/ Chloroplast		
Cell fur/ Cell wall		
Gwagolyn/ Vacuole		

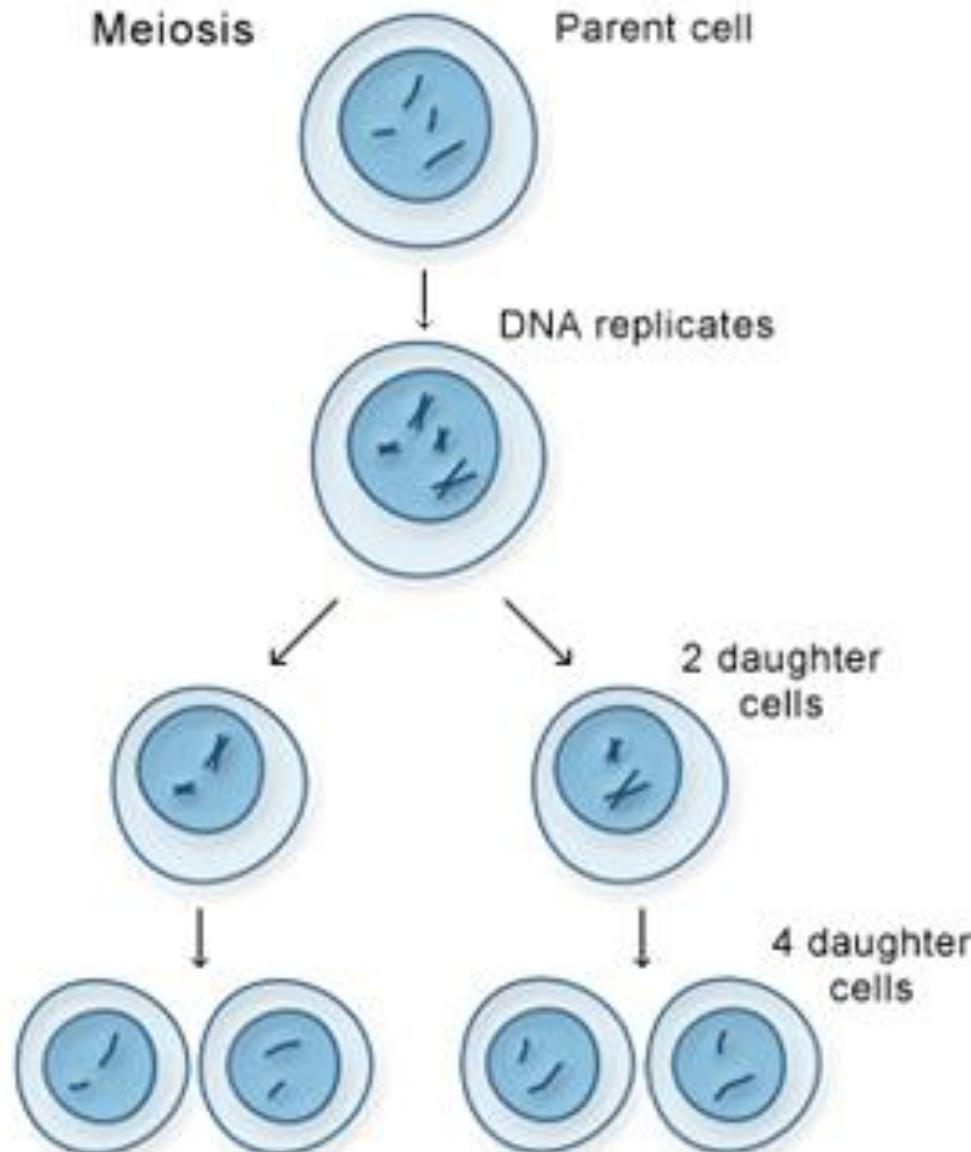
Tyfu / Growth



Mitosis



Meiosis



Meiosis

- Cell raniad sy'n hanneru nifer y cromosomau
- Cell division that halves number of chromosomes
- Mae'n creu gametau/ produces gametes
- Digwydd yn yr organnau rhyw yn unig
- Happens in sex organs only

Mitosis

- Cynhyrchu celloedd gyda'r un nifer o gromosomau a'r gwreiddiol
- Produces cells with same number of chromosomes as original cell
- Ar gyfer tyfu a thrwshio'r corff
- For growth and repair of body
- Digwydd ym mhob rhan o'r corff
- Happens in all parts of body

Tabl adolygu Cellraniad

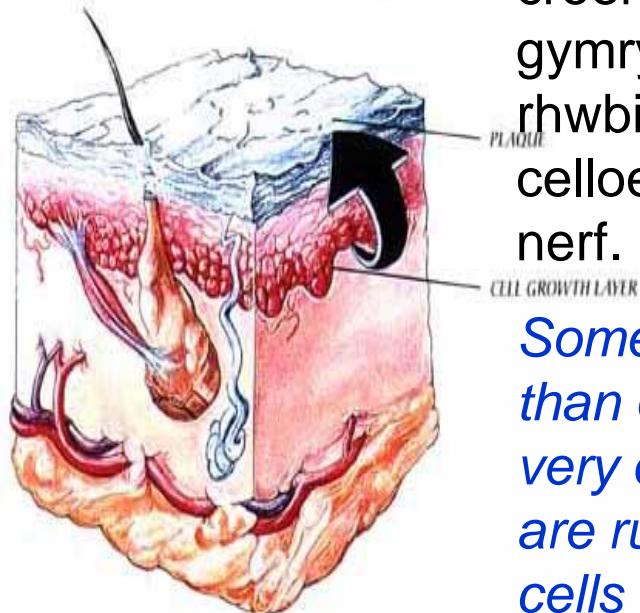
Llenwch y tabl

	Mitosis	Meiosis
Ble?		
Pam?		
Sut?	Cromosomau yn cael eu copio a'r fam gell yn rhannu'n 2	
Nifer o Gromosomau yn y celloedd a gynhyrchir?		Hanner y gwreiddiol

Patrymau tyfiant / Growth patterns

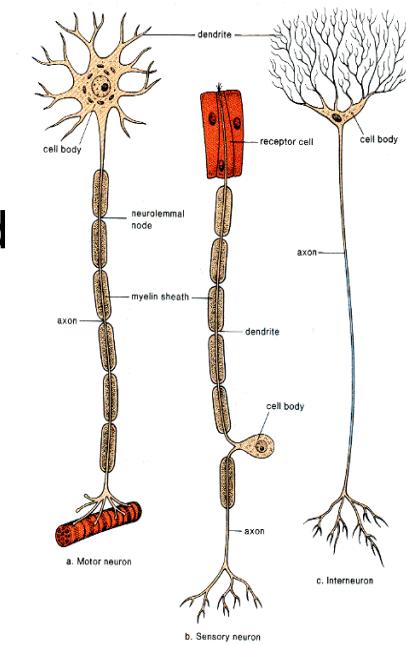
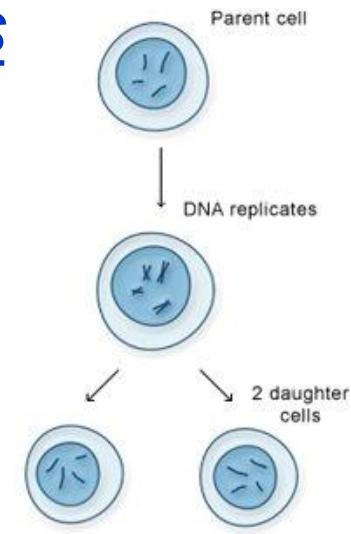
Er mwyn i beth byw dyfu mae'n rhaid iddo greu celloedd newydd. Mae'n gwneud hyn drwy Mitosis.

In order for a living thing to grow it must make new cells. It does this through Mitosis.



Mae rhai meinweoedd yn well am dyfu na eraill. E.e. mae celloedd croen yn gallu tyfu'n gyflym iawn i gymryd lle'r celloedd sy'n cael eu rhwbio i ffwrdd bob dydd. Mae rhai celloedd yn tyfu'n araf. E.e. celloedd nerf.

Some tissues are better at growing than others. e.g. skin cells can grow very quickly to replace the cells that are rubbed away every day. Some cells grow very slowly e.g. nerve cells



Patrymau tyfiant

Growth patterns



Mae anifeiliaid yn tyfu ym mhob rhan o'r corff.

Animals grow in all parts of the body

Tyfiant planhigion

Plant growth



Mae planhigion yn tyfu mewn safleoedd penodol yn unig a elwir yn Meristem

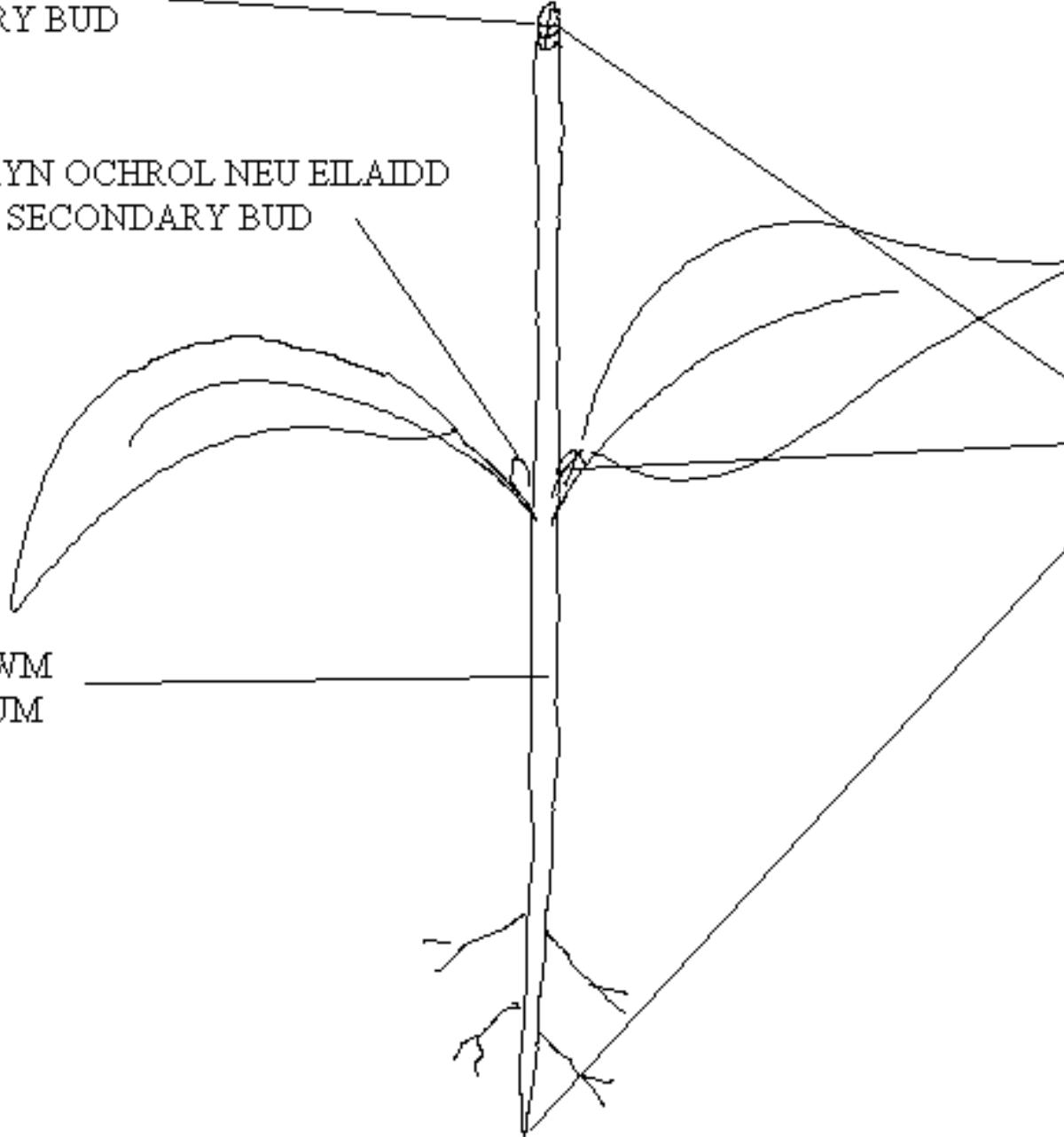
Plants grow at specific points only called Meristem

BLAGUR BLAEN
PRIMARY BUD

BLAGYRYN OCHROL NEU EILAIDD
SIDE OR SECONDARY BUD

CAMBIWM
CAMBIUM

TYFBWYNTIAU
GROWING POINTS



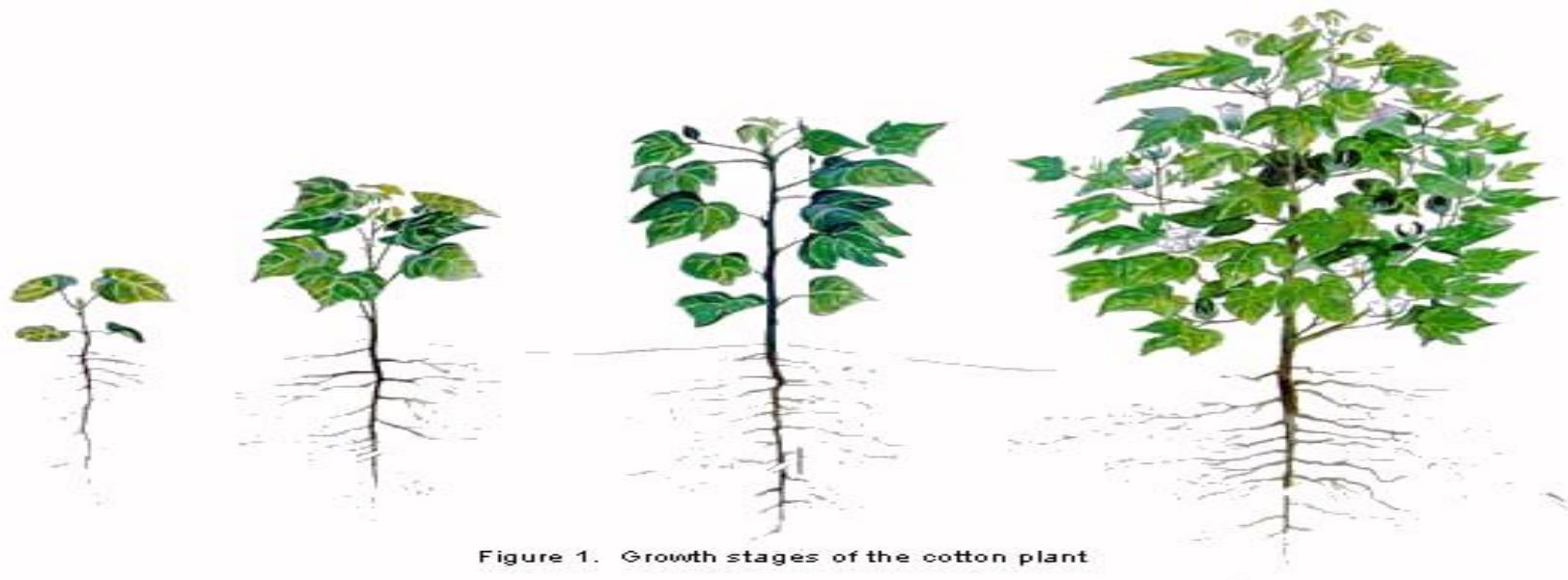


Figure 1. Growth stages of the cotton plant

Mae'r cambiwn yn cynhyrchu haen newydd o dyfiant bob blwyddyn a dyna pham fod coed gyda cylchoedd tyfiant.

The cambium produces a new layer of growth each year and that's why trees have growth rings.

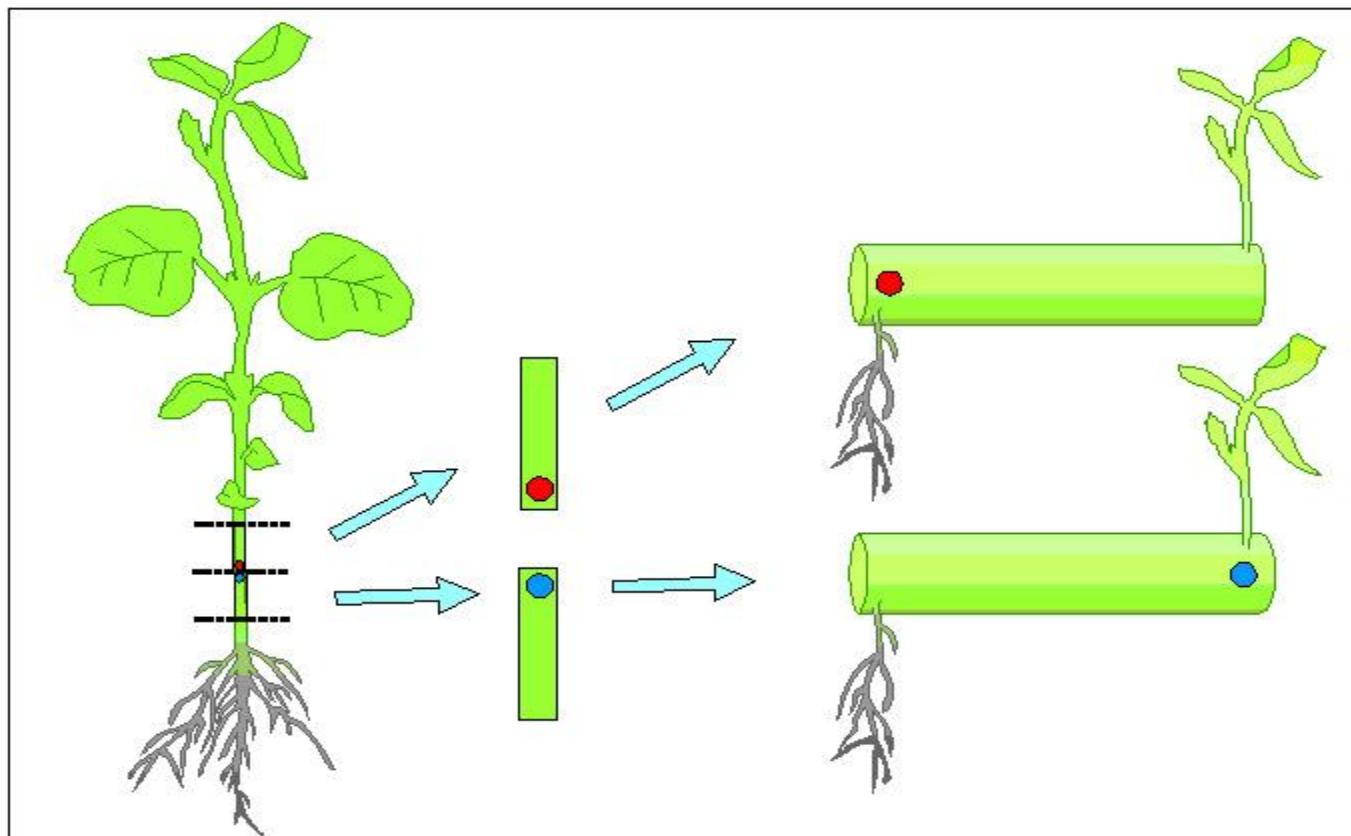
Gellir cyfri'r cylchoedd hyn i rhoi oed y goeden.

These rings can be counted to give the age of the tree.



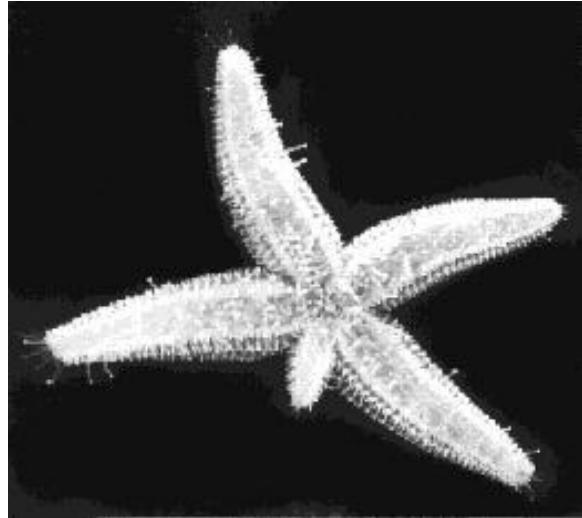
Mae celloedd planhigion yn cadw'r gallu i newid a datblygu i fewn i wahanol fathau o gelloedd e.e. Gall darn o goesyn dyfu dail a gwreiddiau.

Plant cells can keep the ability to develop into different types of cell. E.g. A piece of stem planted into the ground can grow and develop roots and leaves



Mae infertebradau yn gallu tyfu rhannau newydd o'u cyrff wedi iddynt eu colli.

Invertebrates can grow whole new parts to their bodies if they are damaged.

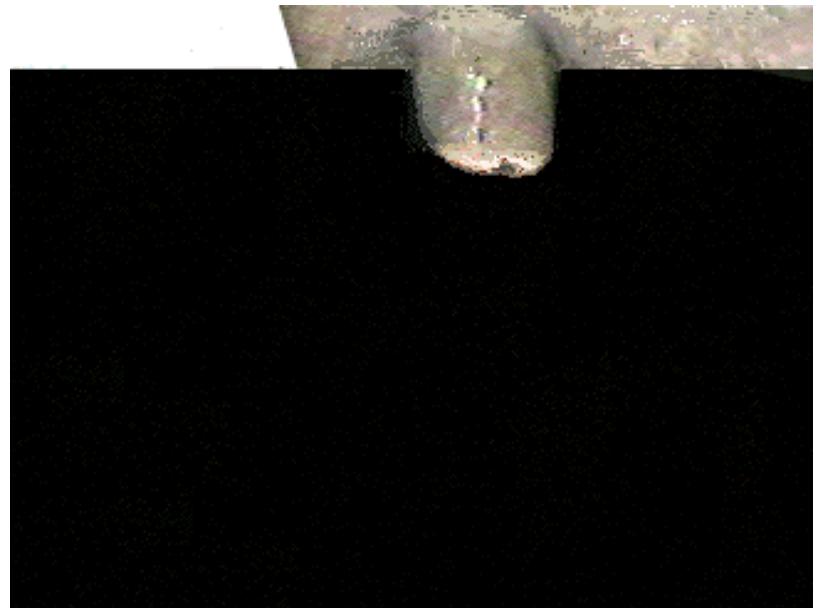


Ychydig iawn o fertebradau sy'n gallu gwneud hyn

Very few vertebrates can do this

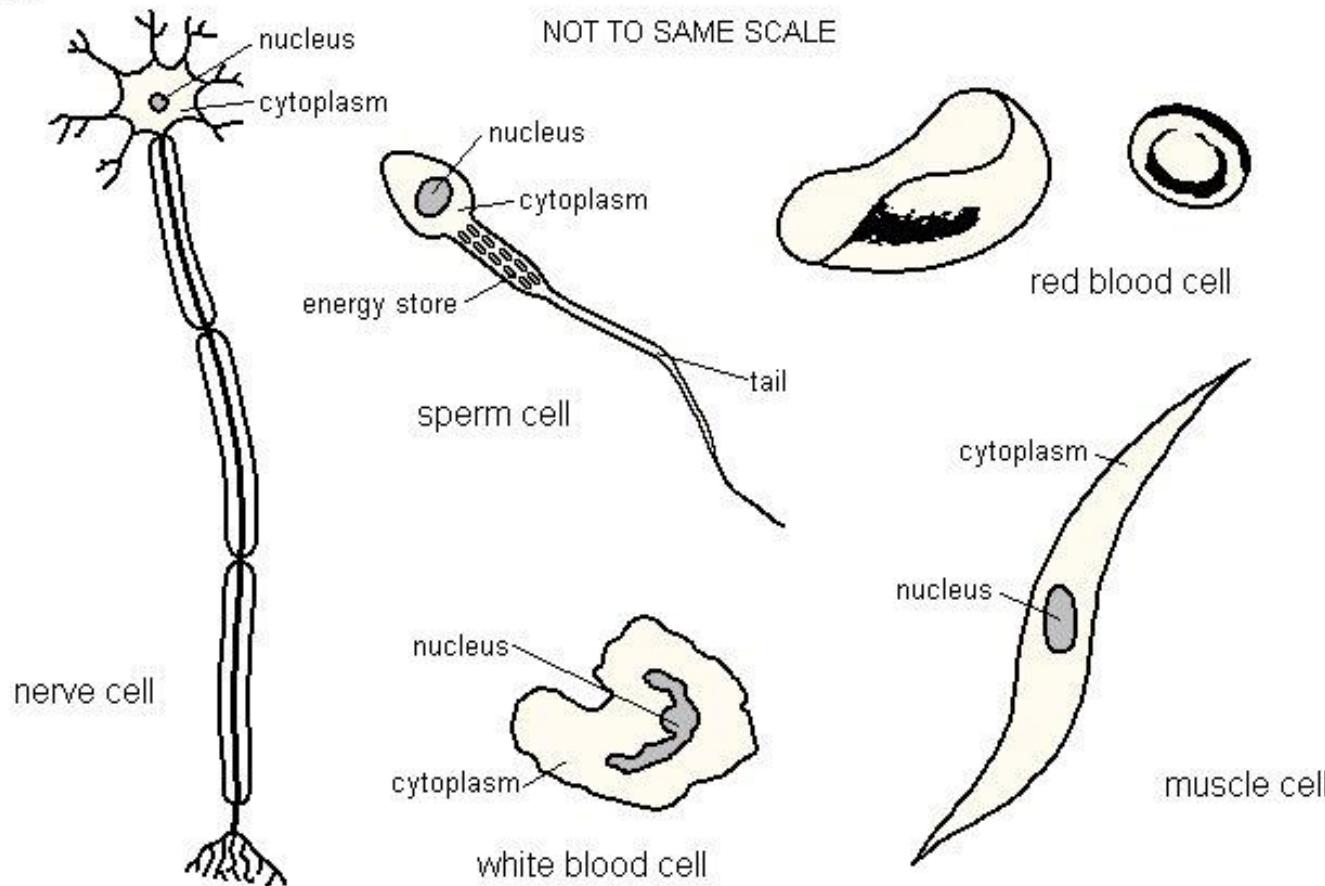
Mae madfall y dwr yn gallu tyfu coes neu lygaid newydd.

A newt can regrow a lost leg or eye



Mae ein cyrff wedi ei wneud o llawer o wahanol mathau o gelloedd cafodd eu creu drwy mitosis o'r wy wedi ei ffrwythloni. Ond wrth i ni dyfu mae ein celloedd yn colli'r gallu i wahaniaethu a newid.

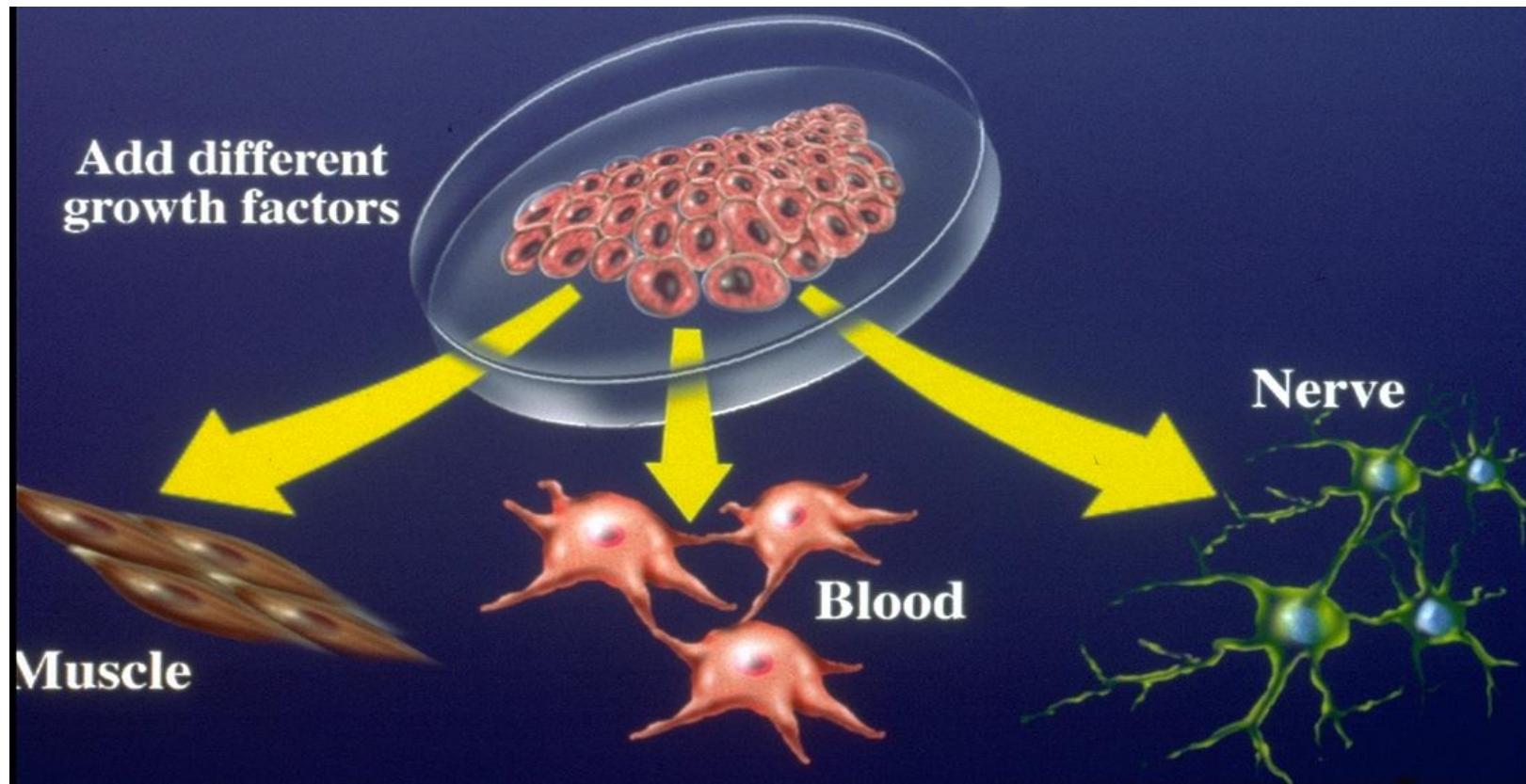
Our bodies are made up of many different types of cells which were all made by mitosis from the fertilised egg. As we get older our cells lose the ability to differentiate and change.



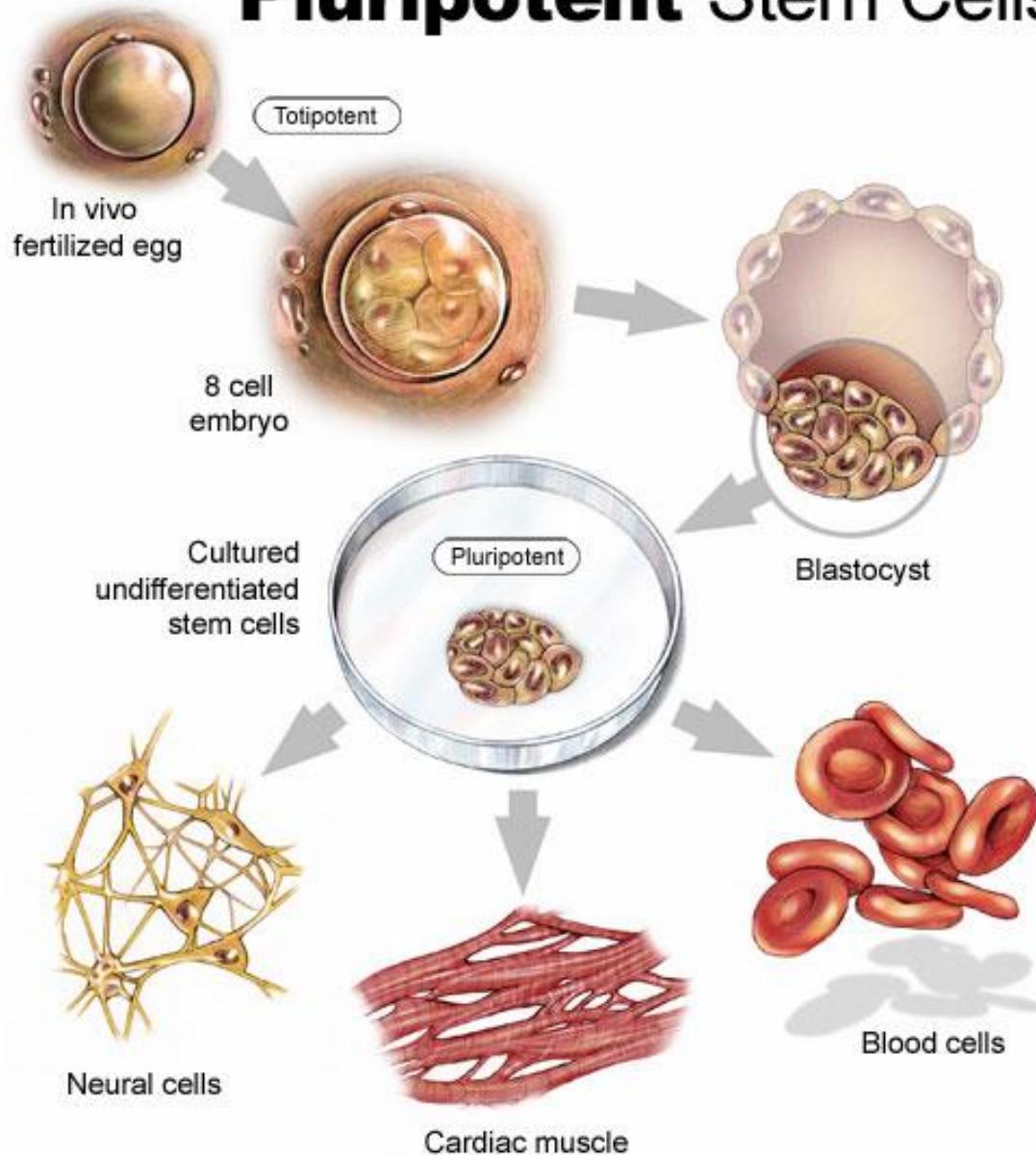
Celloedd bonyn Stem cells

Gelwir y celloedd yma sydd heb golli'r potensial i newid yn gelloedd bonyn.

These cells that have not yet lost the potential to change and develop into different cells are called Stem cells



Pluripotent Stem Cells

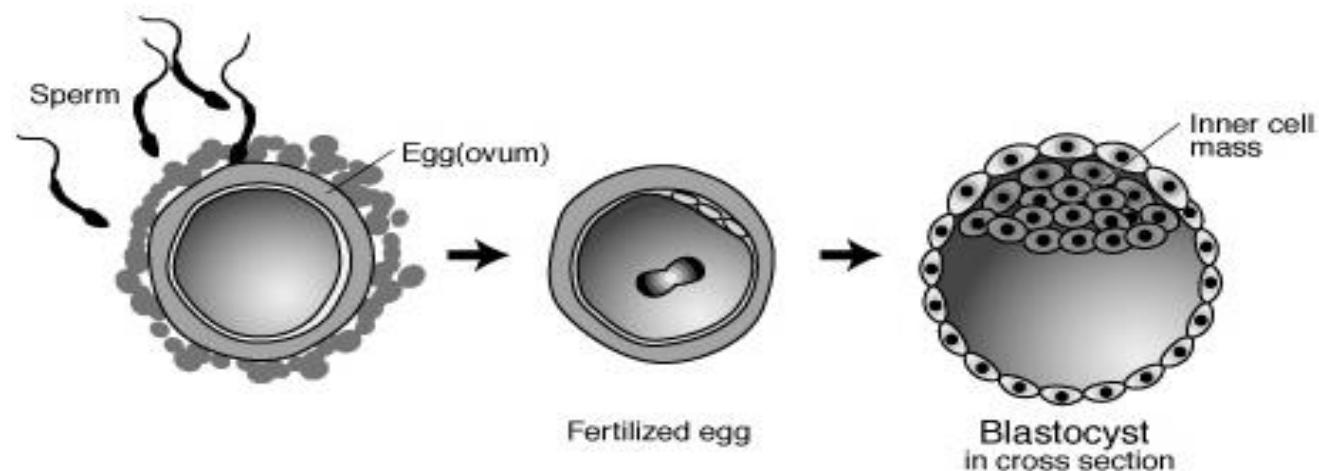


Mae gwyddonwyr yn dechrau gallu tynnu celloedd o wy sy'n datblygu a trwy rhoi gwahanol gemegau arnynt gwneud iddynt ddatblygu'n wahanol mathau o gelloedd.

Y freuddwyd yw gallu creu organnau newydd ar gyfer pobl sydd wedi cael clefydau sydd wedi dinistrio eu organnau.

Scientists are starting to be able to remove some cells from a developing embryo and by adding different substances make these cells grow into different kinds of cells.

The dream is to be able to produce whole new organs for people who have had diseases that damage organs.



Defnydd o gelloedd bonyn.

Use of stem cells

- 1. Triniaeth Leukemia- dinistrio'r celloedd cancr yn y gwaed a thyfu celloedd gwyn newyd.
- 1. Leukemia treatment – Kill cancerous cells in bone marrow and replace with healthy.
- 2. Trin Parkinsons – Rhoi celloedd bonyn yn yr ymenydd i drwsio'r niwed.
- 2. Parkinsons treatment – replace damaged brain cells with stem cells.

Defnydd o gelloedd bonyn.

Use of stem cells

- 3. Trwsio niwed i'r madryddyn cefn er mwyn helpu pobl sydd wedi eu parlysu.
- 3. Fixing damage to the spinal cord to help paralysed people.
- 4. Celloedd pancreas i bobl sydd gyda clefyd siwgr.
- 4. Injecting pancreas cells into diabetics

Da ynteu drwg? Good or bad?

Gallu creu organnau newydd /

Producing new organs

Rhieni yn cael plant er mwyn cael celloedd bonyn ar gyfer gwella brawd neu chwaer.

Parent having another child to get harvest stem cells for sibling.

Arbrofi ar anifeiliaid/
Experimenting on animals.

Storio celloedd bonyn o fabi's er mwyn eu defnyddio yn y dyfodol /

Storing stem cells from newborn in order to use them in the future.

Trawsblaniad mer yr esgyrn i bobl gyda leukemia.

Bone marrow transplants.

Gwella nerfau pobl sydd wedi eu parlysu/ *Helping paralysed people.*

Dinistrio embryo er mwyn cael celloedd bonyn / *Destruction of embryo's in order to get stem cells*

Cwmniau yn cynnig storio celloedd bonyn am bris!

Companies store stem cells-for a price!

Byw am byth! *Immortality!*

Respiradaeth/ *Respiration*

- Respiradaeth yw rhyddhau egni o'n bwyd.
- *Respiration is the release of energy from food*
- Mae popeth byw yn respiradu
- *Every living thing respires*
- Mae 2 fath o respiradaeth.
- *There are 2 main types of respiration*
- 1 Respiradaeth gyda Ocsigen – Aerobig
- *1 Respiration with Oxygen- Aerobic*
- 2 respiradaeth heb ddefnyddio ocsigen – Anaerobig
- *2 Respiration without oxygen- Anaerobic*

Respiradaeth Aerobic/ *Aerobic respiration*

1. Mae respiradaeth aerobic yn digwydd pan mae digon o Ocsigen yn bresenol.

1. Aerobic respiration occurs when there is plenty of Oxygen available

2. Mae'n torri glwcos i lawr yn llwyr i gynhyrchu llawer o egni

2. It breaks down Glucose fully to produce a lot of energy

3. Mae'n effeithiol iawn ac yn rhyddhau llawer o egni.

3. It is very efficient and produces a lot of energy.

4. Mae'n creu Carbon deuocsid a Dwr fel gwastraff.

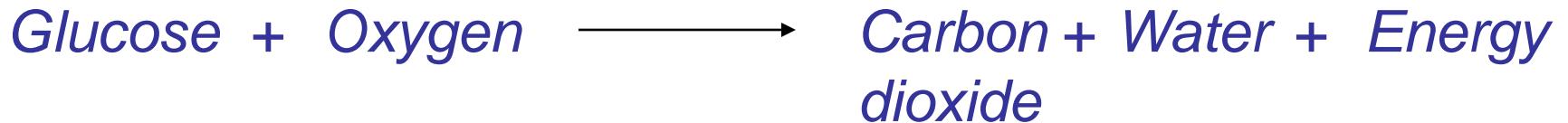
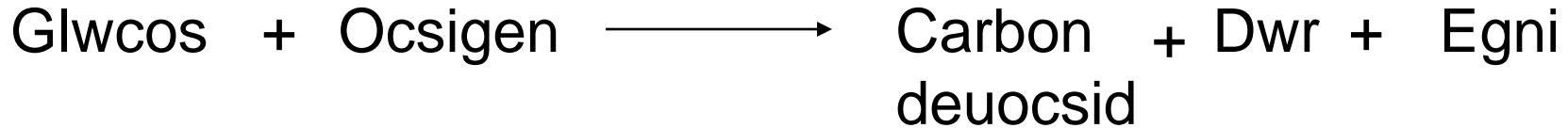
4. It produces Carbon dioxide and water as waste.

5. Respiradaeth aerobic sy'n digwydd gan amlaf yn ein cyrff

5. Aerobic respiration is the main source of energy in our body

Hafaliad respiradaeth aerobig

Aerobic respiration equation



Dysgu hwn!! *Learn this!!!!*

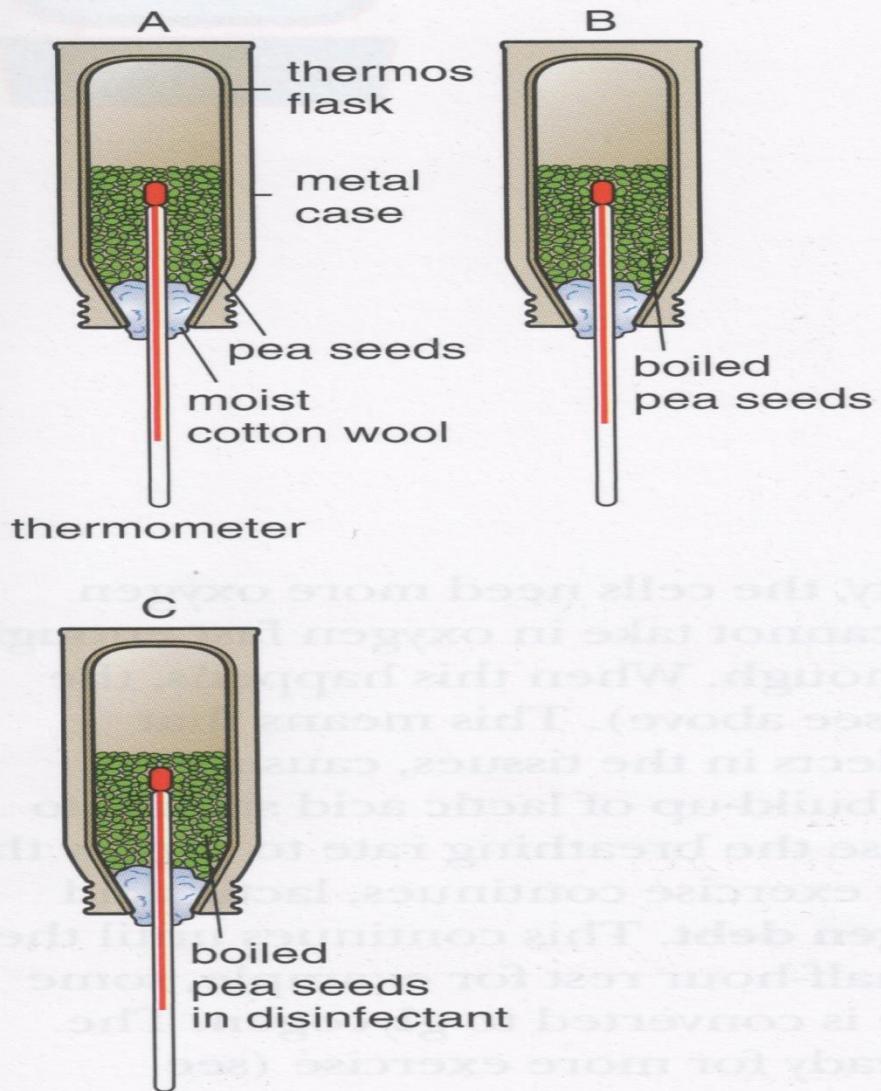


Figure 3.8 Apparatus used to show that, as germinating peas respire, they release energy as heat

Arbrawf Haidd mewn fflasg

Barley in a flask expt.



Cwestiynau/ Questions

- Beth oedd pwrpas y disinfectant?
- *What was the purpose of the disinfectant?*
- Beth oedd mantais defnyddio fflasgiau thermos i gymharu a biceri?
- *What was the advantage of using thermos flasks compared to beakers?*
- Pam ddefnyddwyd gwlan cotwm yn hytrach na corcyn rwber?
- *Why are cotton wool plugs used rather than rubber corks?*
- Pa fflasg yw'r rheolydd?
- *Which flask is the control?*
- Esboniwch y canlyniadau ym mhob fflasg.
- *Explain the results in each flask.*

Respiradaeth anaerobig

Anaerobic respiration

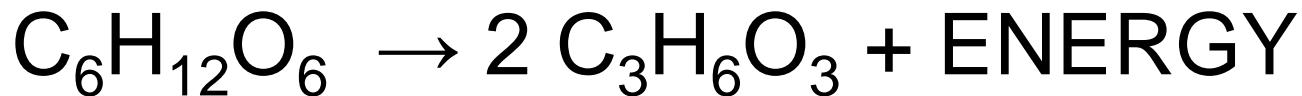
- Mae respiradaeth anaerobig yn digwydd pan nad oes digon o ocsigen yn bresennol.
- *Anaerobic respiration occurs when there is a shortage of Oxygen*
- Mae'n rhyddhau ffracsiwn o'r egni a gynhyrchir pan fo ocsigen ar gael.
- *It releases a fraction of the energy of aerobic respiration*
- Yn ddom ni mae'n cynhyrchu Asid lactig sy'n achosi i'r cyhyrau flino.
- *In humans it produces Lactic acid which builds up causing fatigue in the muscle.*

Hafaliad respiradaeth anaerobig

Anaerobic respiration equation

Glwcos → Asid lactig + Ychydig o egni

Glucose → Lactic acid + A little energy



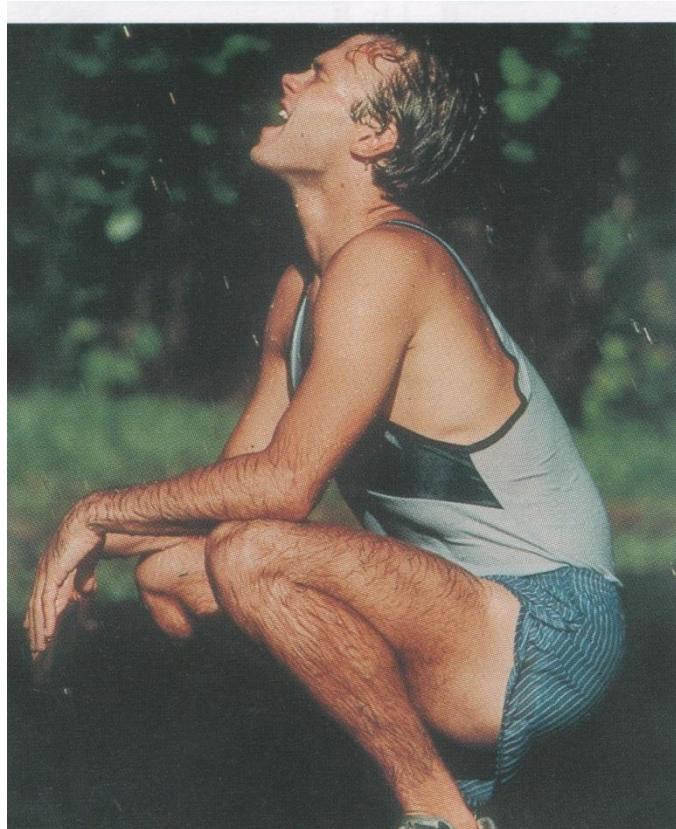
Y ddyled ocsigen

The oxygen debt

- Wedi ymarfer mae'n rhaid i'r corff cael gwared o'r asid lactig.
- *After exercise the body must get rid of the lactic acid.*
- Mae'n cael ei gyfuno gyda ocsigen i greu carbon deuocsid a dwr.
- *It is combined with oxygen to make Carbon dioxide and water.*
- Dyma pam rydym allan o wynt a wedi blino am gyfnod wedi ymarfer.
- *This is why we are out of breath and tired after exercise*

Asid lactig + Ocsigen → Carbon deuocsid + Dwr (Noder - Dim Egni)

Lactig acid + Oxygen → Carbon dioxide + Water (Note – No energy)



Resbiradaeth anaerobic mewn burum

Anaerobic respiration in yeast

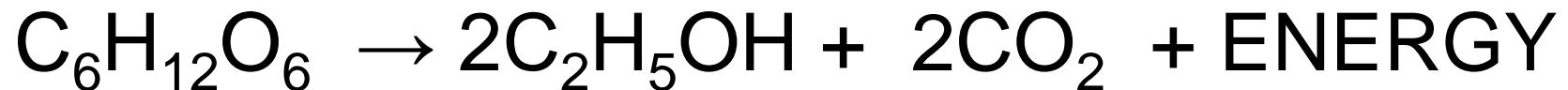
- Mae burum yn respiradu'n anaerobic gan gynhyrchu ethanol a charbon deuocsid
- Yeast respires anaerobically to produce ethanol and carbon dioxide
- Mae'n cael ei ddefnyddio i greu cwrw a gwin ac i roi'r swigod mewn bara
- It is used to make beer and wine and to put the bubbles in bread

Hafaliad resbiradu anaerobig mewn burum

Equation for anaerobic respiration in yeast

Glwcos → Ethanol + Carbon deuocsid + Ychydig o egni

Glucose → Ethanol + Carbon dioxide+ A little energy



Symudiadau i fewn ac allan o
gelloedd

Movement in and out of cells

Trylediad

Diffusion

- Symudiad gronynnau hylif neu nwy o grynnodiad uchel I grynnodiad isel.
- Nid yw trylediad yn defnyddio egni.
- Movement of liquid or gas particles from a high concentration to a low concentration.
- Diffusion does not need energy.

Engreifftiau o drylediad

Examples of diffusion

- Ocsigen yn symud o'r gwaed i fewn i gelloedd
- Carbon deuocsid yn symud o gelloedd i'r gwaed
- Oxygen moves from blood into cells
- Carbon dioxide moves from cells into blood

- Ocsigen yn symud o'r aer i fewn i'r gwaed yn yr ysgyfaint.
- Oxygen moves from the air into the blood in the lungs.
- Alcohol yn symud o'r stumog i'r gwaed.
- Alcohol moves from stomach to blood

OSMOSIS

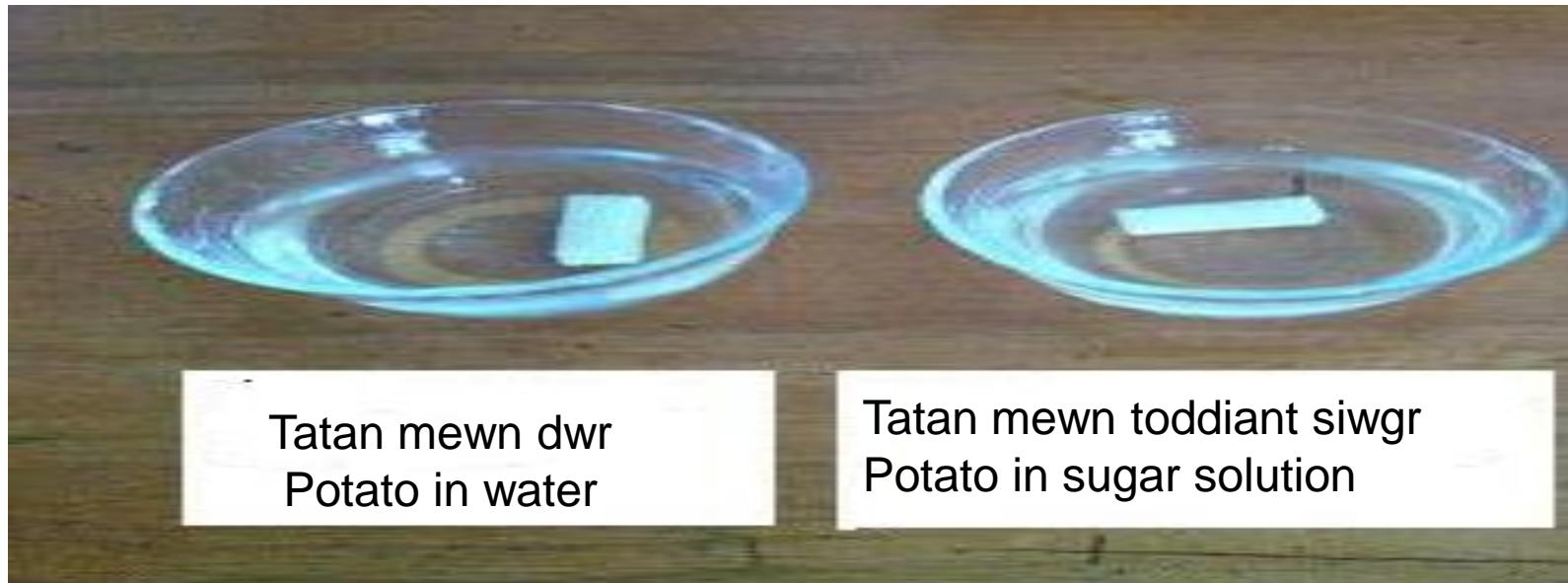
Osmosis yw symudiad wrd o grynnodiad uchel o ddŵr i grynnodiad isel o ddŵr trwy bilen led-athraidd.

Movement of water from a high concentration of water to a low concentration of water through a semi permeable membrane

Darllenwch y frawddeg– Beth mae o'n olygu?

Arbrawf sglodion tatws

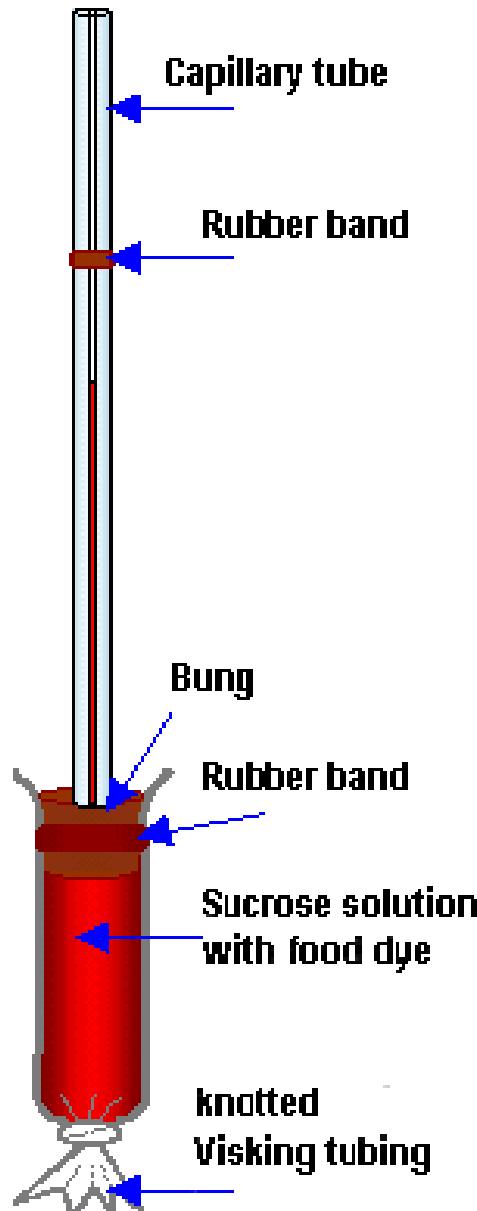
Potato chip experiment



Tatan mewn dwr
Potato in water

Tatan mewn toddiant siwgr
Potato in sugar solution

Gadael yr arbrawf am 20-30 munud
Leave experiment for 20-30 minutes



Beth sy'n digwydd pan rydym yn rhoi'r tiwb yma mewn dŵr pur?

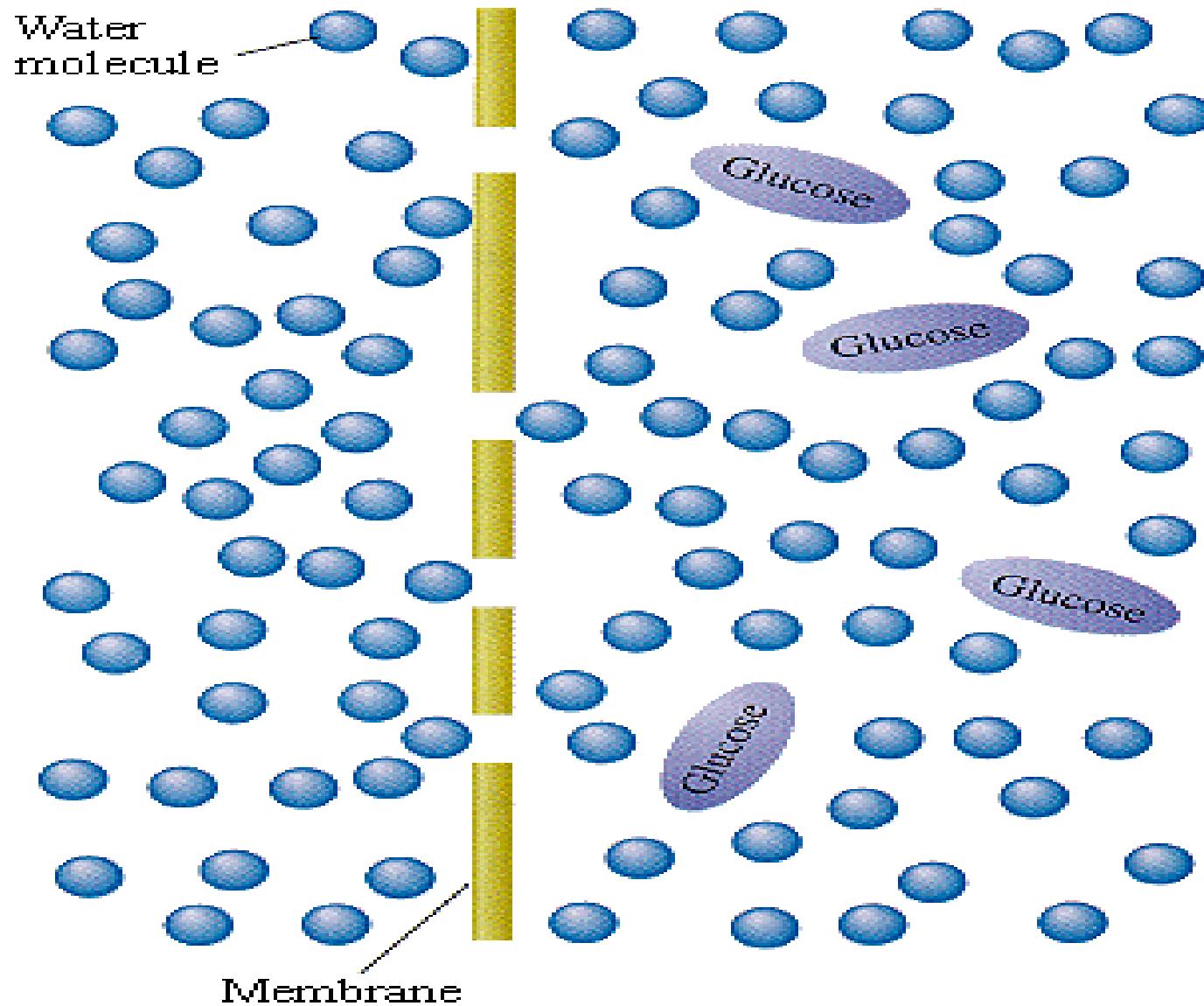
What happen when we place the tube in pure water?

Mae'r lefel dŵr yn y tiwb yn codi!

Pam?

The level of water in the tube rises!

Why?



- Mae'r dwr yn symud i fewn i'r tiwb visking oherwydd fod crynodiad uwch o ddwr y tu allan yn y dwr pur.
- Nid yw'r siwgr yn symud allan o'r tiwb visking oherwydd fod y tyllau yn y Pilen lled athraidd (Tiwb Visking) yn rhy fach.
- Water moves into the visking tubing because there is a higher concentration of water outside the tube in the water.
- Sugar does not move out of the visking tube because the holes in the selectively permeable membrane (Visking tubing) are too small.

Osmosis

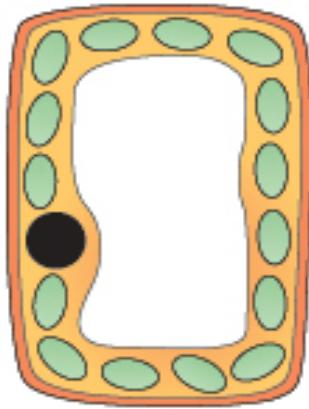
- Symudiad wr o grynnodiad uchel o ddwr I grynnodiad isel o ddwr trwy bilen led-athraidd.
- Movement of water from a high concentration of water to a low concentration of water through a semi permeable membrane

Canlyniadau'r arbraf sglodion tatws

Results of potato chip experiment.

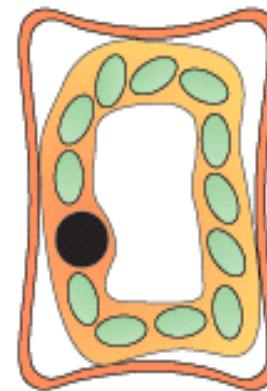
Beth ddigwyddodd i'r celloedd tatws mewn dŵr pur?

What happened to the potato cells in pure water?



Beth ddigwyddodd i'r celloedd tatws mewn dŵr siwgr?

What happened to the potato cells in sugar solution?



Tatws mewn dŵr / Potato in water

Pam fod hyn wedi digwydd?

Why did this happen?

Pa ffordd oedd y dŵr yn symud?

Pam?

Which way did the water move?

Why?

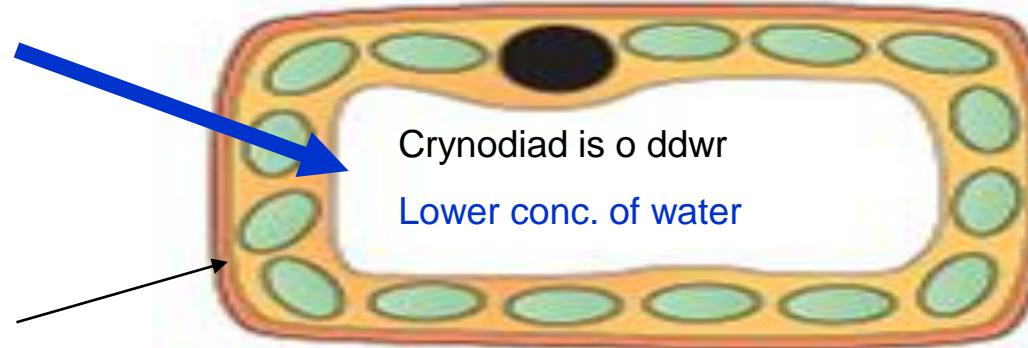


Crynodiad uchel o ddwr

High conc. of water

Pilen led-athraidd

Semi permeable membrane



Cell yn CHWYDD-DYNN. Cell is TURGID

Tatws mewn dŵr siwgr / Potato in sugar solution

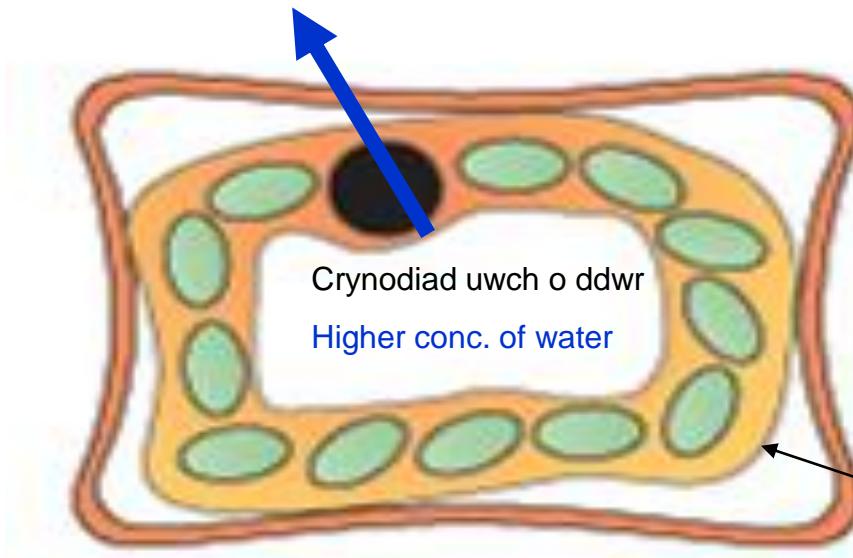
Beth ddigwyddodd a pham?

What happened and explain why?



Crynodiad is o ddwr

Lower conc of water



Crynodiad uwch o ddwr
Higher conc. of water

Mae'r gell yn FFLASID

The cell is FLACCID

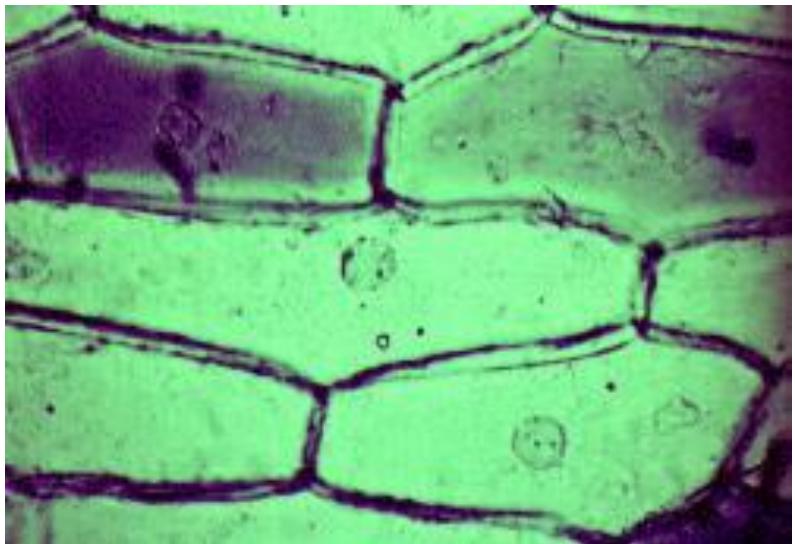
PLASMOLYSIS. Y cytoplasm wedi lleihau a symud o'r cellfur.

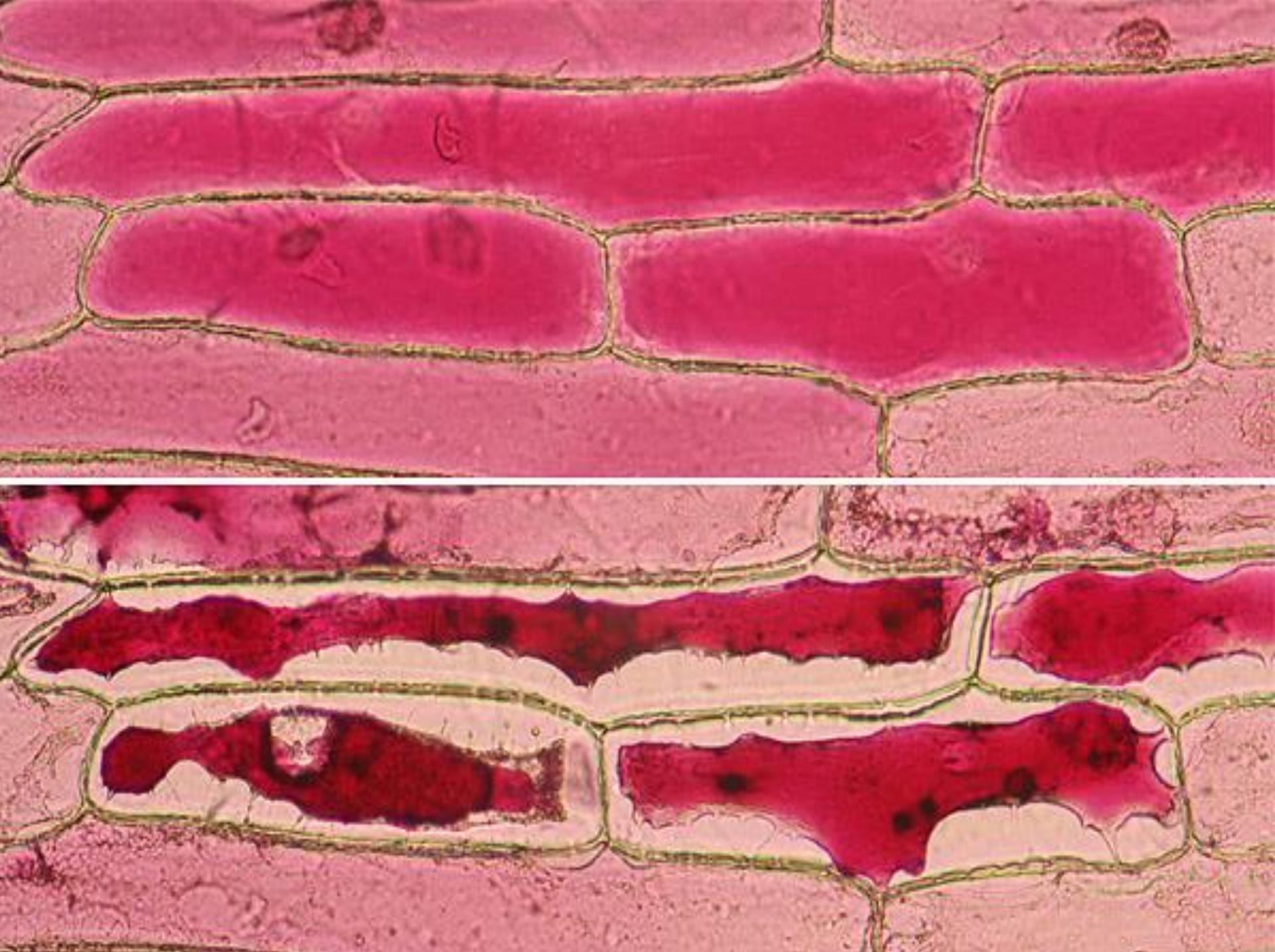
PLASMOLYSIS. The cytoplasm has shrunk away from the cell wall

Arbrawf osmosis mewn tatws

Osmosis in potatoes experiment

- Beth oedd y gwahaniaeth rhwng y 2 daten wedi 30 munud?
- What differences were there between the potatoes after 30 mins?
- Esboniwch y newidiadau yn nhermau symudiadau dwr oherwydd osmosis.
- Explain these differences in terms of water movement due to osmosis
- Pam fod ffermyr pysgod dim ond yn rhoi 18Kg o bysgod gyda rhew mewn box 20Kg?
- Why do fish farmers only place 18Kg of fish with ice into 20Kg boxes?
- Pam fod planhigion yn gwywo os ydynt yn cael eu boddi gyda dwr mor?
- Why do plants wilt if they get flooded by sea water?





Cludiant actif / Active transport

- Mewn cludiant actif mae sylweddau yn symud yn groes i'r graddiant trylediad.
- In active transport substances are absorbed against the diffusion gradient.
- E.e Mewn gwreiddiau mae'r celloedd yn amsugno mwynau o'r pridd lle mae crynodiad isel o fwynau I fewn i'r celloedd lle mae crynodiad uchel o fwynau.
- E.g. In roots the cells absorb minerals from the soil where there is a low concentration into the cell where there is a higher concentration of minerals

- Mae cludiant actif yn defnyddio llawer o egni
- Active transport uses a lot of energy

