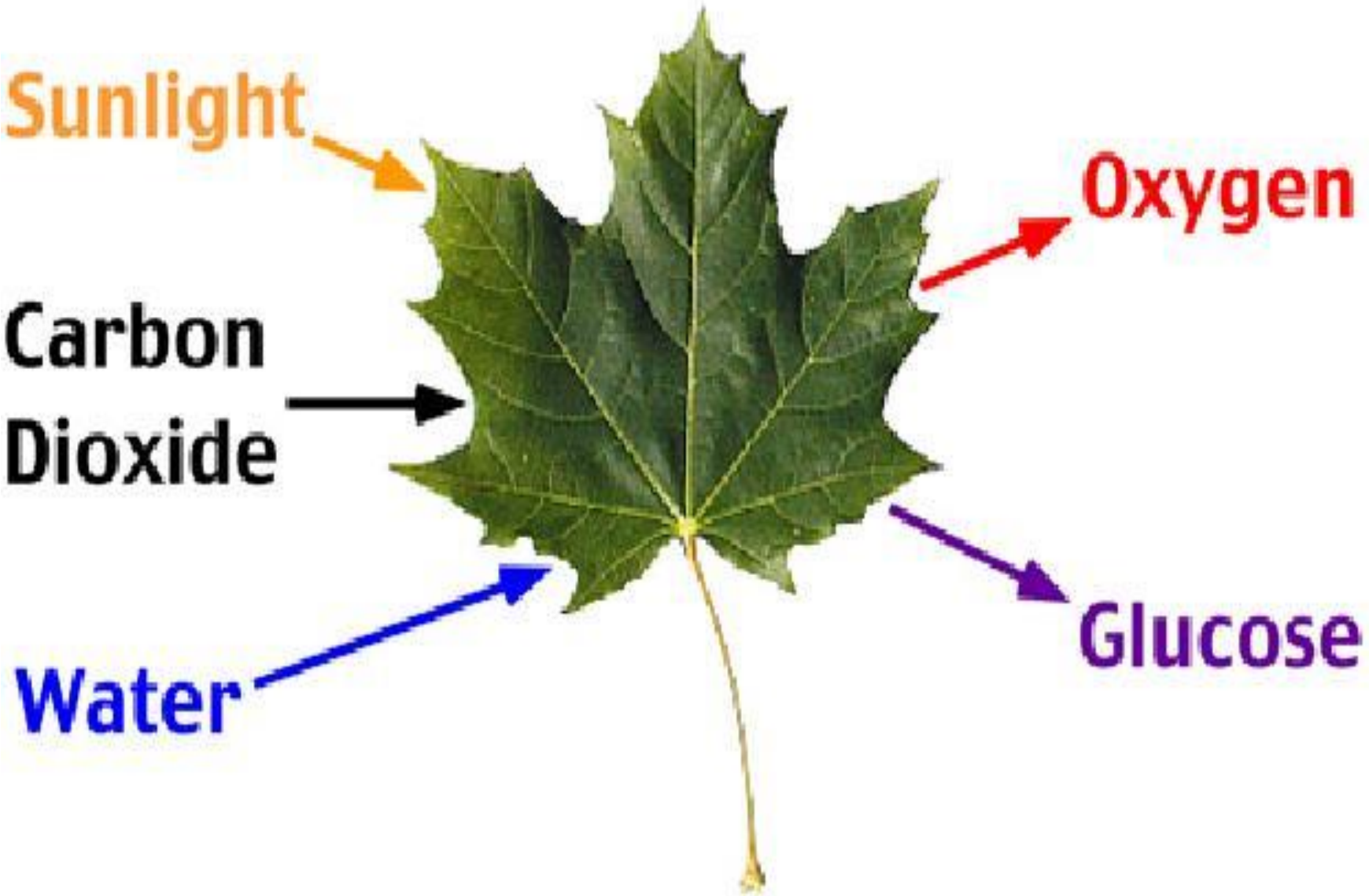
Ffotosynthesis

Photosynthesis


Sunlight
Oxygen
Carbon Dioxide
Glucose
Water

Pam fod ffotosynthesis mor bwysig?

Why is Photosynthesis so important?

1. Mae'n creu'r holl ocsigen yn yr atmosffer

1. It produces all the oxygen in the atmosphere

2. Mae'n creu glwcos sy'n dechrau pob cadwyn fwyd

2. It produces glucose which is the start of every food chain

Sut mae'r planhigyn yn defnyddio'r glwcos?

How do plants use the glucose?

1. Cynhyrchu egni drwy respiradaeth ar gyfer tyfiant ac yn y blaen

1. For energy through respiration for growth etc.

2. Cynhyrchu protein trwy ei gyfuno a Nitrogen o'r pridd

2. For making protein by combining it with Nitrogen from the soil

3. Creu seliwlos ar gyfer cell furiau

3. To make cellulose for cell walls

4. Cynhyrchu starts I storio egni

4. Produce starch in order to store energy

5. Creu'r holl gemegau oddifewn celloedd y planhigyn

5. Produce all the chemicals within cells

Ffactorau cyfyngu ffotosynthesis

Photosynthesis limiting factors

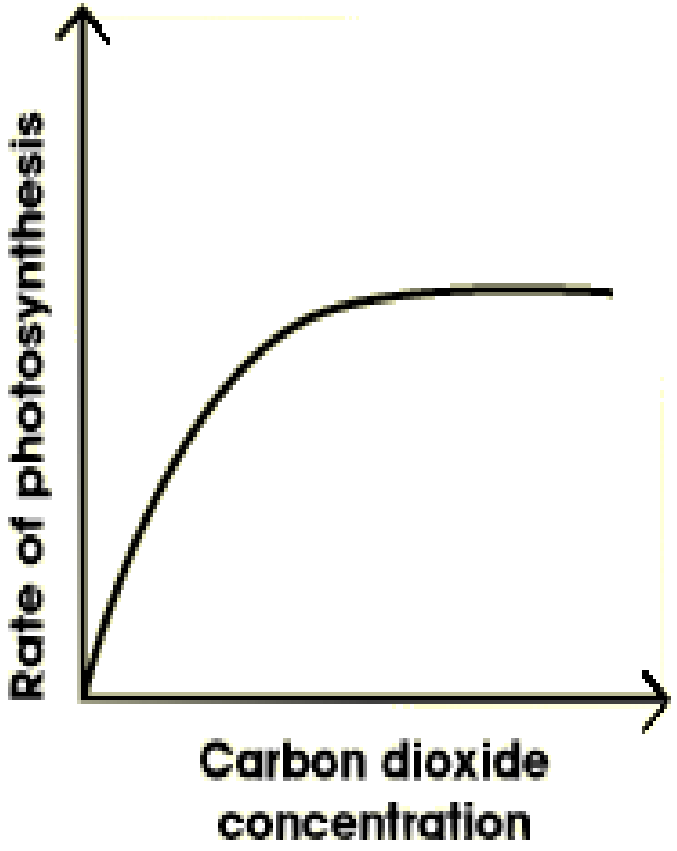
Mae sawl ffactor yn effeithio ar ffotosynthesis ac ynatal iddo ddigwydd ar ei lawn botensial.

There are several factors that affect photosynthesis and stop it happening at it’s full potential

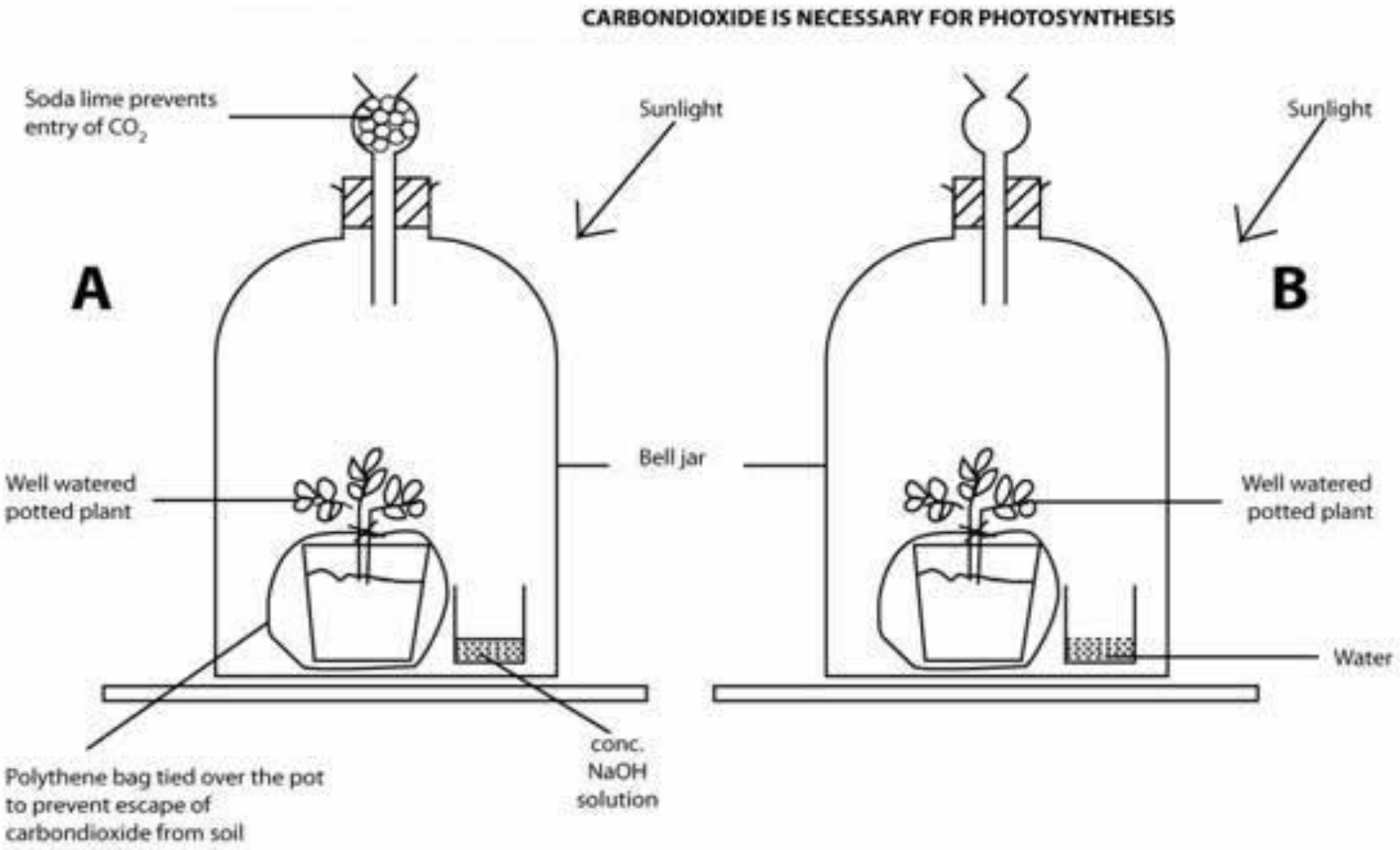
Carbon deuocsid

Carbon dioxide

- Dim ond 0.0385% o'r aer
- Only 0.0385% of the atmosphere
- Mae angen 6 carbon deuocsid i greu 1 glwcos.
- The plant needs 6 Carbon dioxide molecules to make one glucose molecule

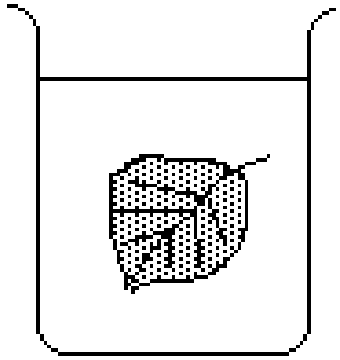


Oes angen CO_2 ar gyfer Ffotosynthesis?

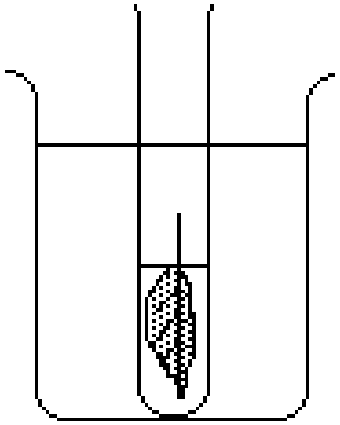


Profi dail am starts

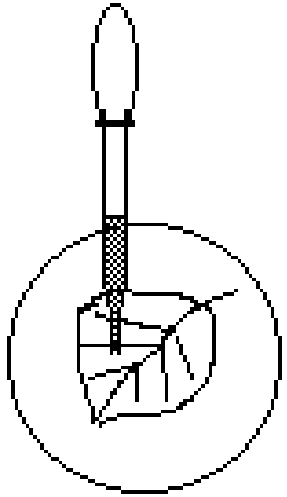
Testing a leaf for starch from photosynthesis



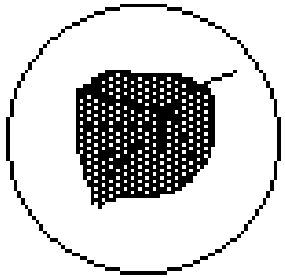
1. Drop the leaf in boiling water to break the cell walls.



2. Put the leaf into meths in a boiling tube and heat this in the boiling hot water to extract the green chlorophyll.



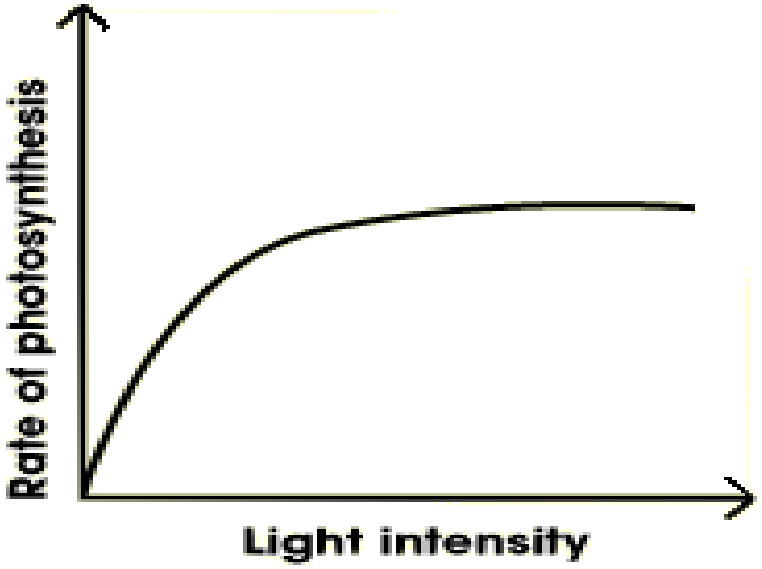
3. Wash the white leaf in hot water then, in a petri dish add a few drops of iodine solution,



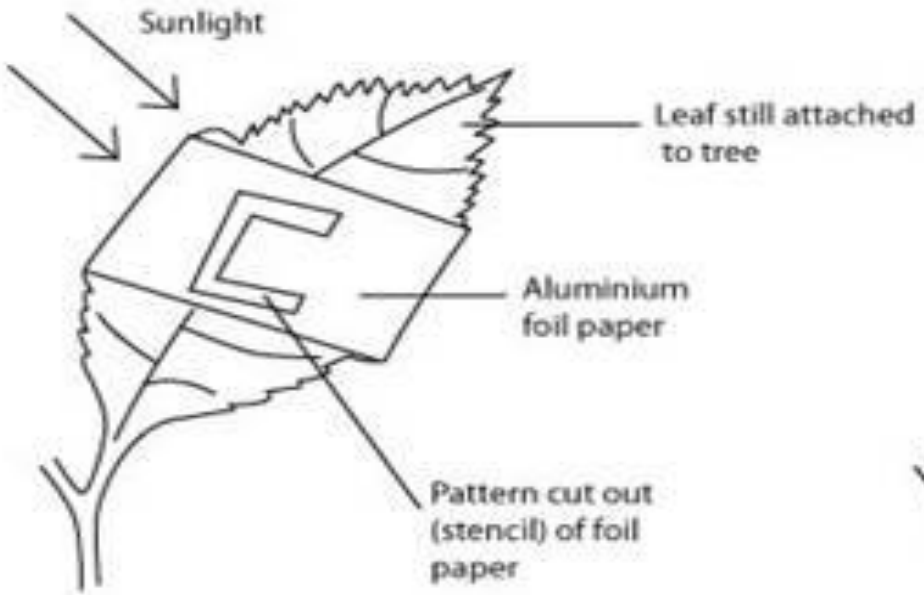
4. If photosynthesis has occurred the leaf will turn black because it will have starch present.

Golau Light

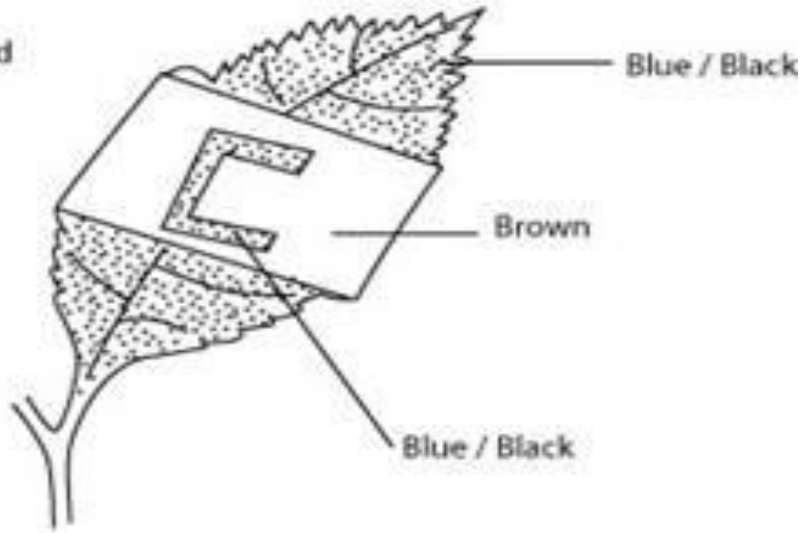
- Mae cloroffyl angen egni golau I dorri dwr I lawr ar gyfer creu glwcos gyda ffotosynthesis.
- Chlorophyl needs light energy to break water down for photosynthesis.
- Felly y mwyaf o egni golau y mwyaf o ffotosynthesis!
- So the more light the more photosynthesis!
- Simples!



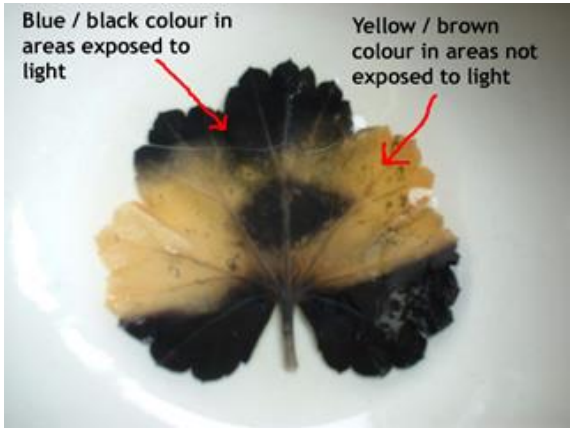
TO SHOW THAT LIGHT IS NECESSARY FOR PHOTOSYNTHESIS



(a) Previously destarched leaf which is then illuminated for some hours

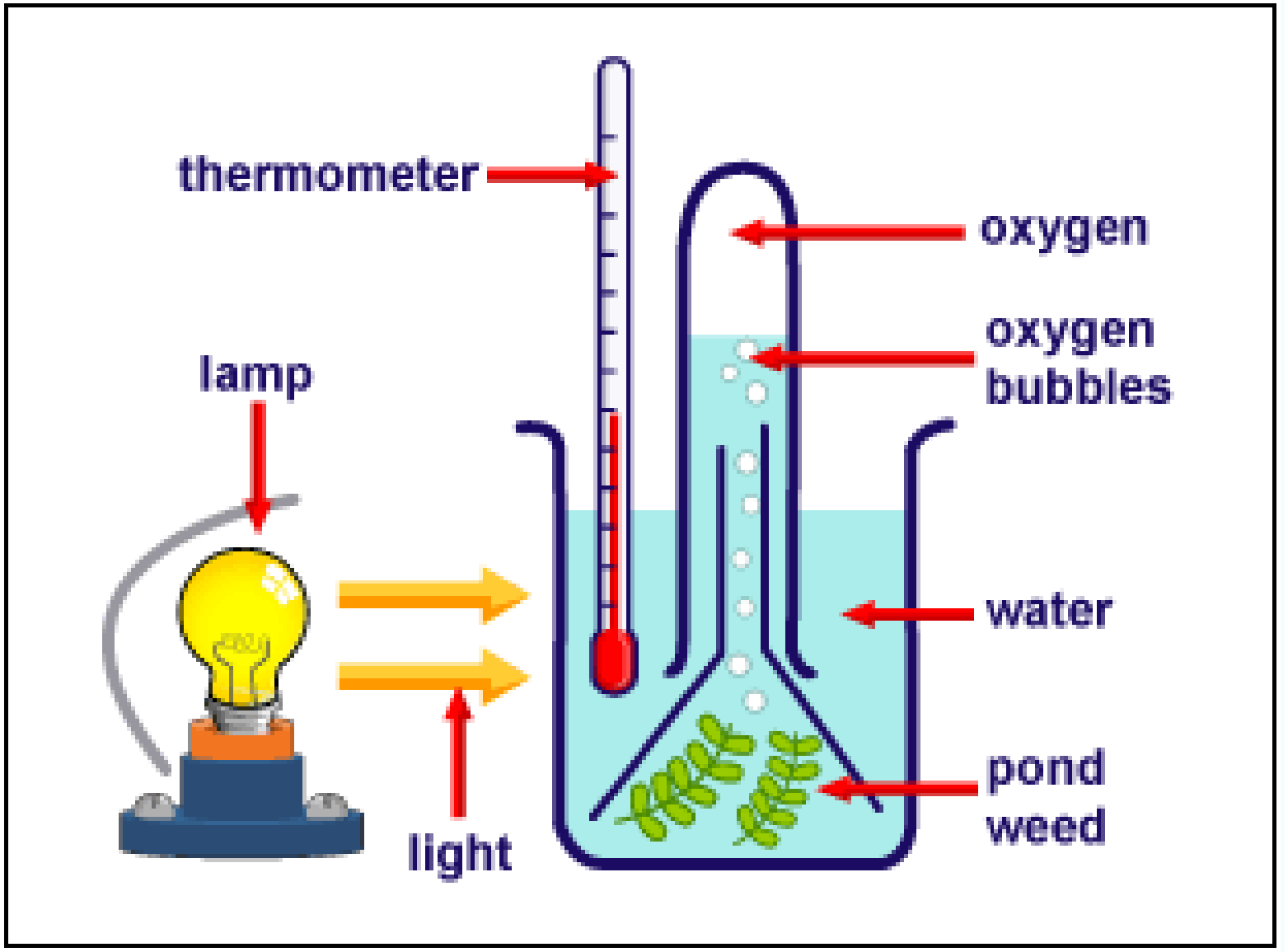


(b) Appearance of leaf after testing with Iodine solution



Tymheredd/Temperature

- Mae fotosynthesis yn broses gemegol ac felly mae'n gyflymach os yw'r tymheredd yn cynyddu.
- Photosynthesis is a chemical process so the warmer it is the faster photosynthesis will happen.
- Ond os yw'n rhy boeth mae'r ensymau yn cael eu dinistrio ac mae'r broses yn peidio a digwydd.
- But if it is too hot the enzymes in the plant will be destroyed and photosynthesis will stop.

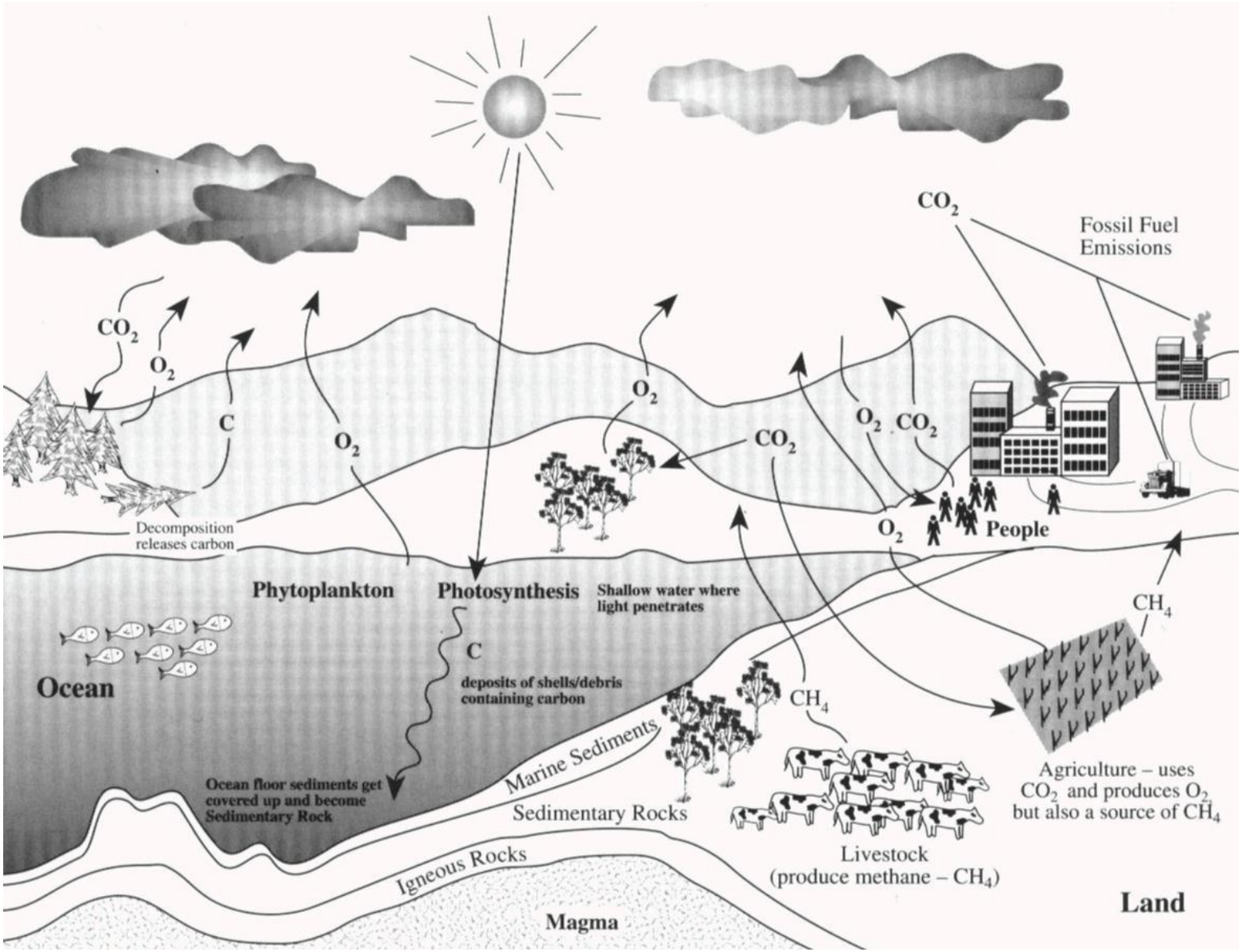

thermometer
oxygen
oxygen bubbles
lamp
water
pond weed
light

Tasg ffotosynthesis

- Mae cwmni am gynhyrchu tanwydd biomass drwy dyfu algae mewn dwr.
- Maent wedi rhoi y dasg i chi ddarganfod o dan pa amodau mae ffotosynthesis yn digwydd gyflymaf.
- Defnyddiwch y rhaglen Focus educational-Biology-Photosynthesis i ddarganfod y crynodiad CO2,tymheredd a chryfder golau gorau ar gyfer ffotosynthesis.

Photosynthesis task

- A company wants to produce biomass fuel by growing algae in water.
- They have given you the task to find out under which conditions photosynthesis happens quickest.
- Use the program Focus educational-Biology-Photosynthesis to find out the best CO2 concentration, temperature and light conditions for photosynthesis to occur.


CO_2
Fossil Fuel Emissions
CO_2
O_2
C
O_2
O_2
CO_2
O_2 CO_2
O_2
People
Decomposition releases carbon
Phytoplankton
Photosynthesis
Shallow water where light penetrates
CH_4
C
deposits of shells/debris containing carbon
Ocean
CH_4
Marine Sediments
Ocean floor sediments get covered up and become Sedimentary Rock
Sedimentary Rocks
Agriculture – uses CO_2 and produces O_2 but also a source of CH_4
Igneous Rocks
Livestock (produce methane – CH_4)
Land
Magma

Y gylched garbon

The carbon cycle

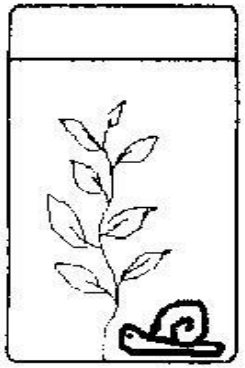
- Mae lefel carbon deuocsid yr atmosffer yn aros yn gyson ar tua 0.0385%
- The Carbon dioxide level of the atmosphere stays constant at about 0.0385%.
- Mae ffotosynthesis yn tynnu Carbon deuocsid o'r atmosffer.
- Photosynthesis removes Carbon dioxide from the atmosphere

- Mae resbiradaeth mewn pethau byw a hylosgi yn rhoi y Carbon deuocsid yn ol.
- Respiration in living things and combustion puts the Carbon dioxide back.
- Ond heddiw mae llai o goed a mwy o losgi tanwyddau felly mae'r Carbon deuocsid yn cynyddu!
- But today there are less trees and more fuels are being burnt so the carbon dioxide is increasing!

Photosynthesis and respiration

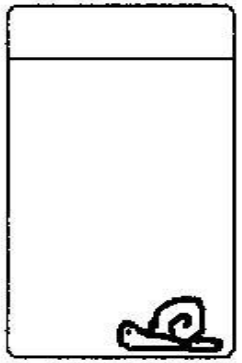
Six bottles where filled with water and set up as shown below. They where sealed to make them airtight.

A.



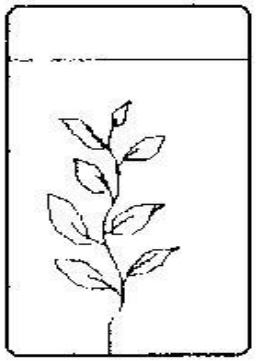
Dim golau/No light
Planhigyn/Plant
Malwen/Snail

B.



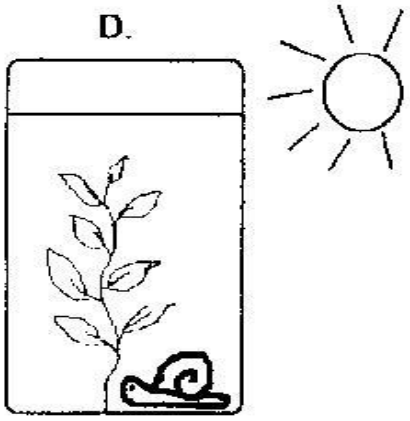
Dim Golau/No light
Dim planhigyn/No plant
Malwen/Snail

C.



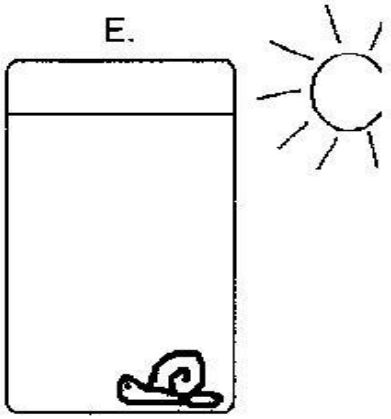
Dim Golau/No light
Planhigyn/Plant
Dim Malwen/No Snail

D.



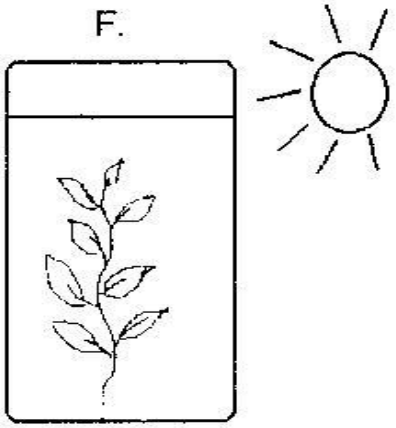
Golau/Light
Planhigyn/Plant
Malwen/Snail

E.



Golau/Light
Dim Planhigyn/No plant
Malwen/Snail

F.



Golau/Light
Planhigyn/Plant
Dim malwen/No snail