



Photosynthesis

LEARN AT CHESTER ZOO

Photosynthesis

Photo - involving light **Synthesis** - making

The process of photosynthesis is unique to plants & algae.

Animals need food but are unable to make their own so some will eat plants – plants are known as PRODUCERS, and animals as CONSUMERS.

Plants use light energy to make food to grow using specially adapted organelles called chloroplasts.

IN

When we make something, we usually mix together a few things
- these are our **INPUTS** (eg. flour, sugar & egg), to get our
OUTPUT – the cake!

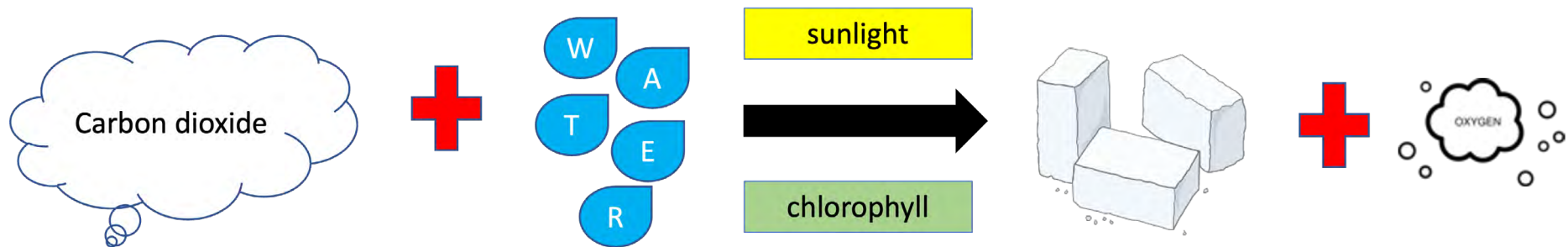
OUT



What do plants need to mix together to make food?

- **Carbon-dioxide** - a gas found in air
- **Water** - usually found in soils
- They also need **energy** from sunlight

What do plants need to mix together to make food?

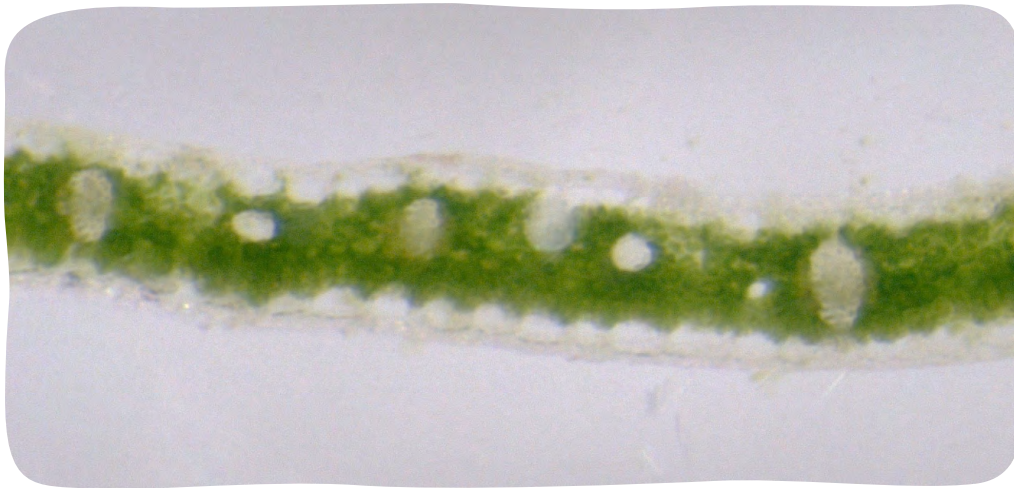


Carbon dioxide + Water  **Glucose + Oxygen**

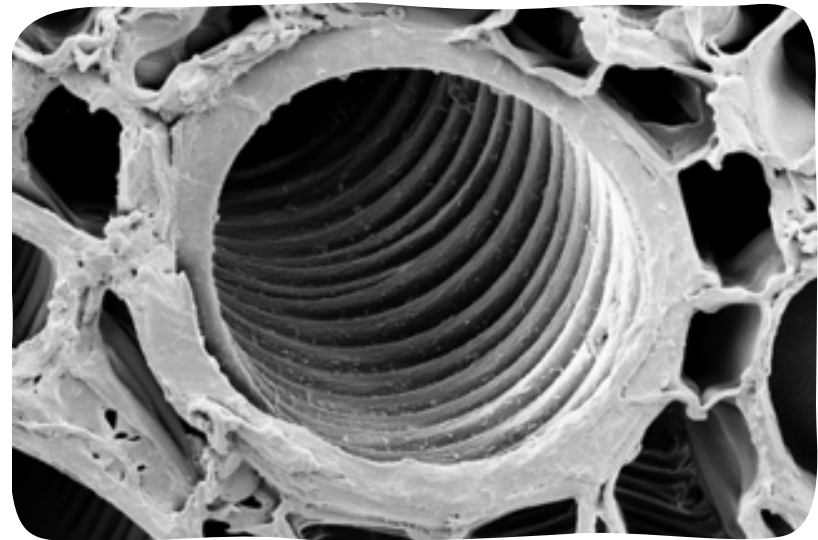
IN

How are plants adapted for photosynthesis?

Carbon dioxide + Water



Carbon-dioxide – is absorbed through tiny pores in leaves called stomata (found mainly on the underside of the leaf).



Water – is absorbed by the roots, and transported through xylem vessels (above), to the leaves and then transpired.

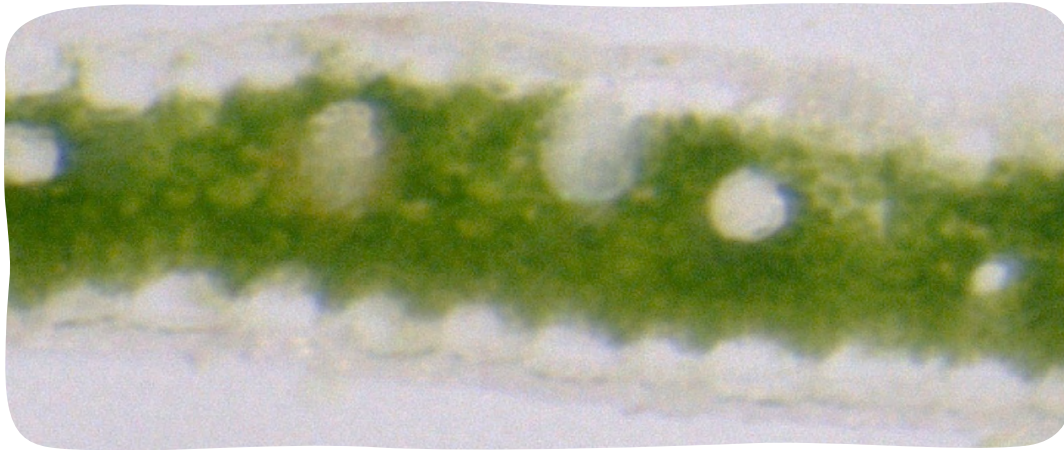
IN

How are plants adapted for photosynthesis?

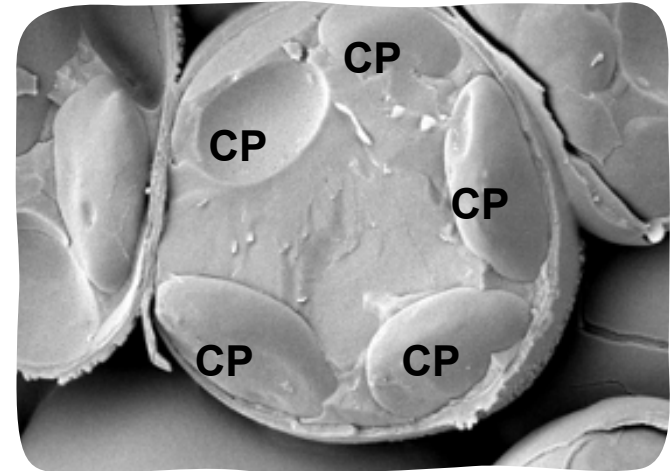
Carbon dioxide + Water

sunlight

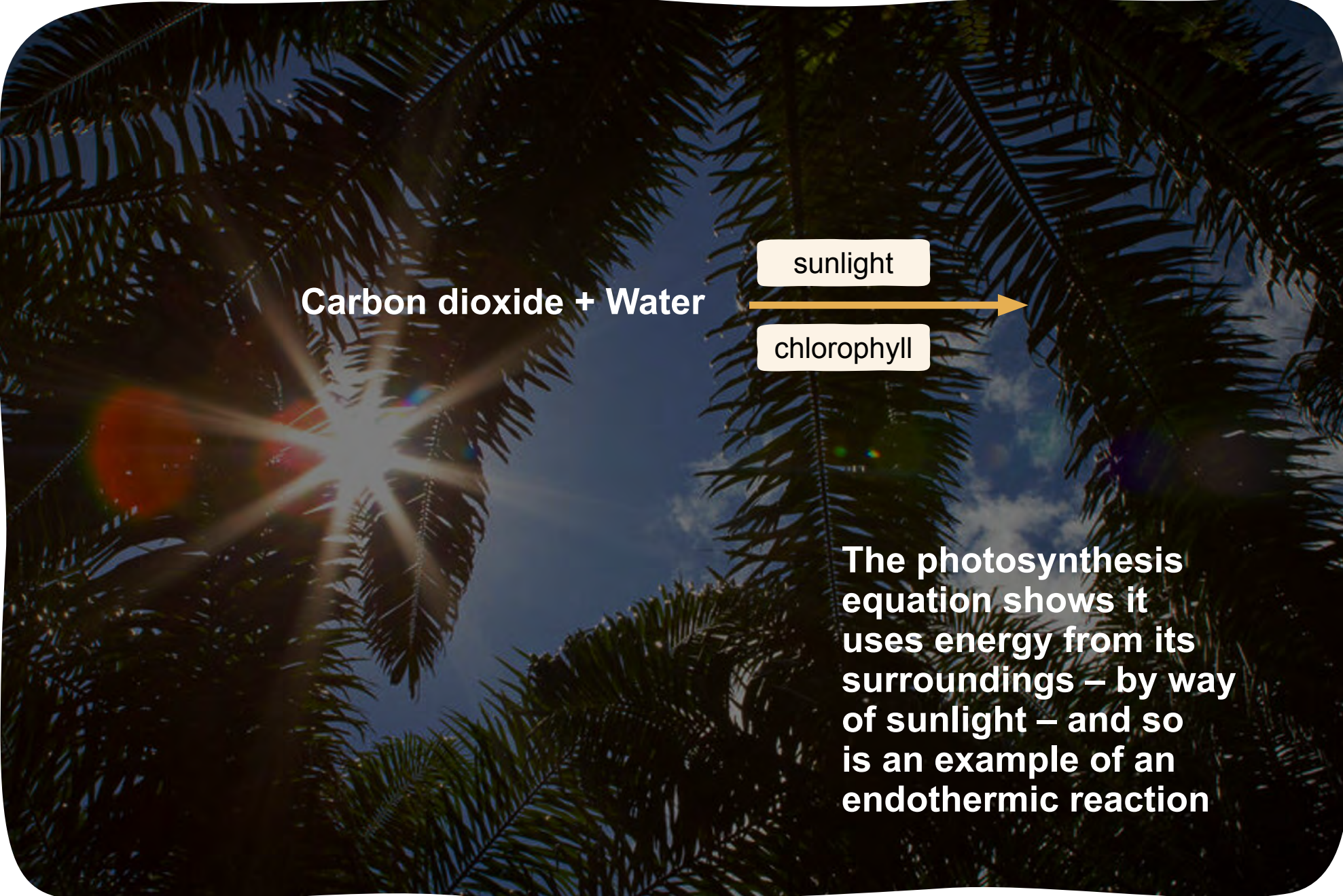
chlorophyll



Sunlight – the reaction does not happen alone, it needs light energy from sunlight, which is captured by the green pigment in plants called chlorophyll. Note the clear cells on the leaf edge.



Chlorophyll is found in structures called chloroplasts (which are seen here in a cross-section of a mesophyll cell).



Carbon dioxide + Water

sunlight

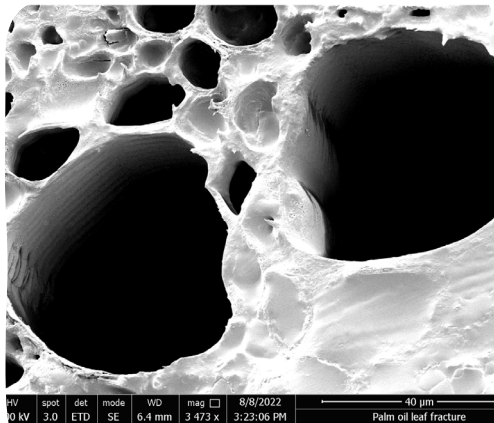
chlorophyll

The photosynthesis equation shows it uses energy from its surroundings – by way of sunlight – and so is an example of an endothermic reaction

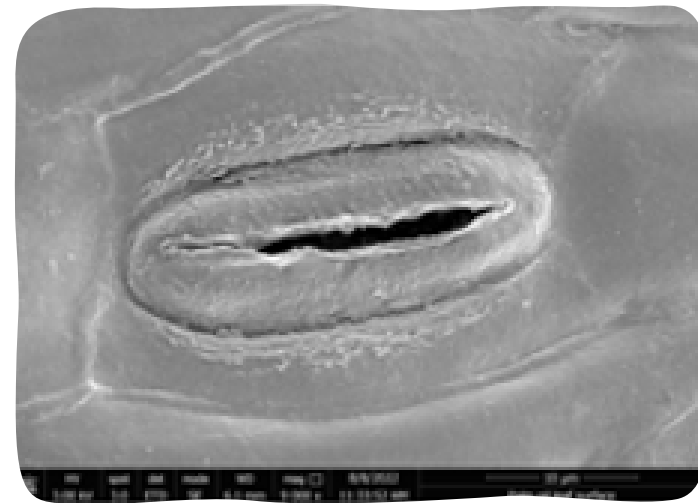
The products of photosynthesis (What is made?)

OUT

Carbon dioxide + Water \longrightarrow **Glucose + Oxygen**



Glucose - a sugar, is the first product of photosynthesis. It is stored as starch (a collection of glucose molecules stuck together).

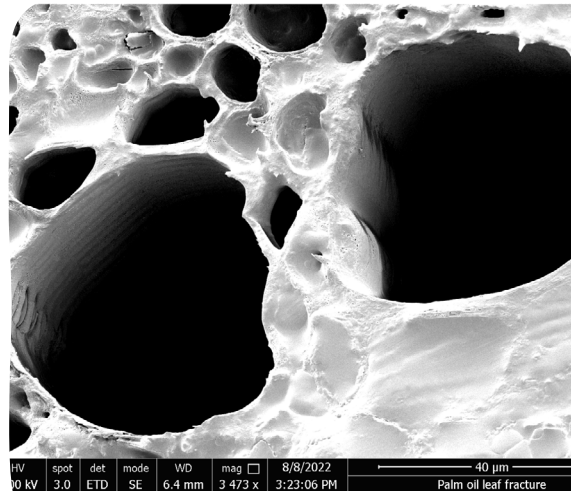


Oxygen - escapes into the atmosphere through open stomata maintaining levels atmospheric oxygen.

More about glucose

OUT

Stored for later
(usually as starch)



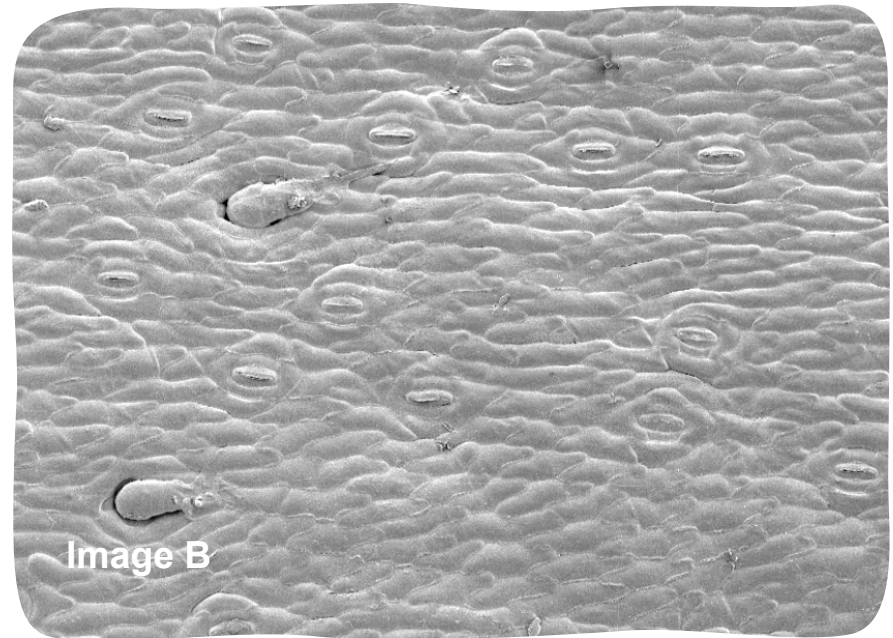
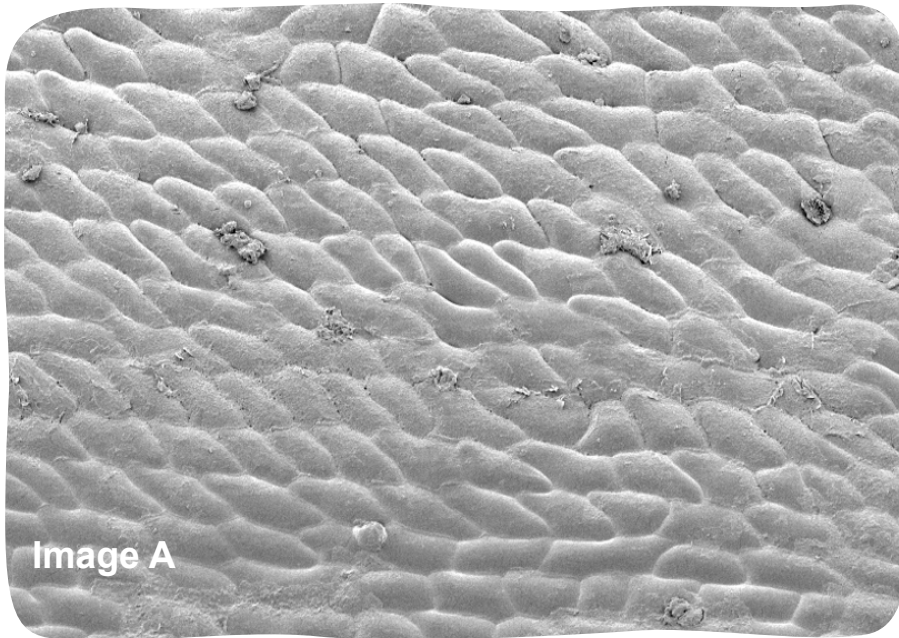
Respiration which
happens day & night!

New plant tissue (growth),
and giving food for others

Stored for later as oil,
which can be harvested

The picture shows an upper and lower
leaf surface of oil palm:

Which is the upper and which is the lower and why?



Photosynthesis and SPO

- Photosynthesis in plants is critical to maintaining the balance of CO₂ and O₂ in the atmosphere.
- Removal of plants and trees from primary forests, to establish palm oil plantations, irreversibly damages this balance, because of the time taken to re-establish such ecosystems.
- Deforestation and land clearing releases stored Carbon dioxide back into the atmosphere contributing to global warming.
- Delicate food chains and more complex food webs, are disrupted by these changes with the original plants being the basis of life on earth in that ecosystem.
- **Sustainable** palm oil systems commit to No Deforestation approaches.