# Gas exchange in plant leaves (pg 137)

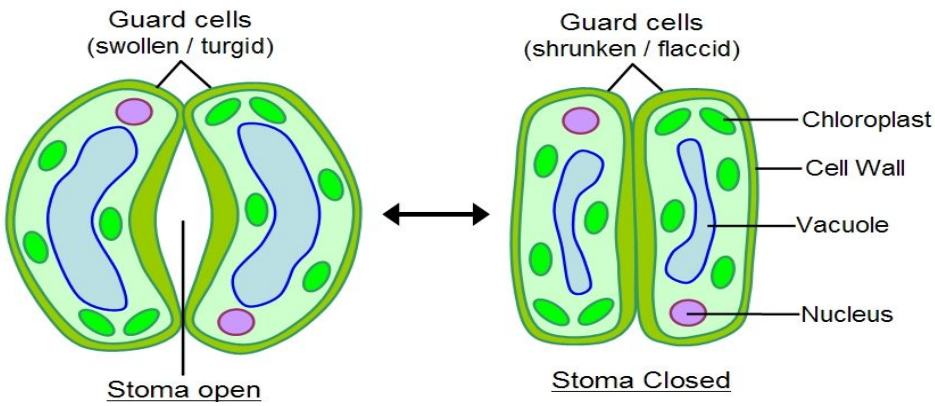
## Plants need to take in:

- $O_2$ for respiration
- $CO_2$ for photosynthesis

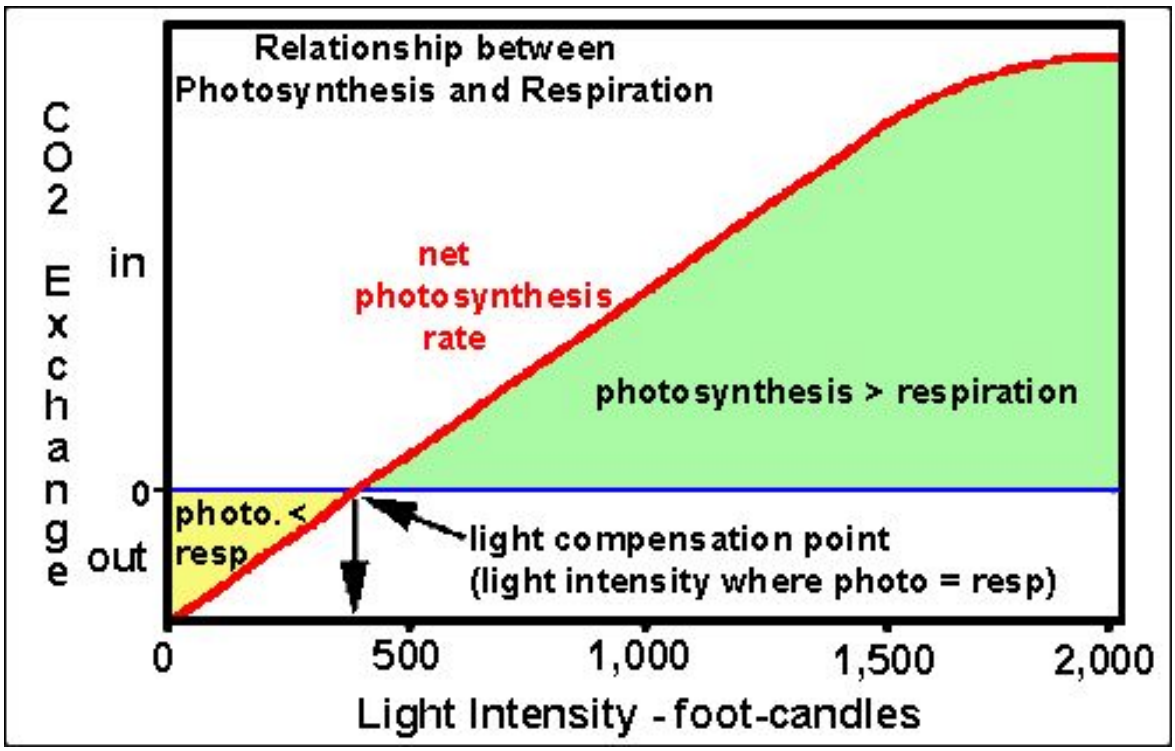
- $O_2$ released during photosynthesis, but most of it diffuses into the air
- Similarly, most of the $CO_2$ produced in photosynthesis diffuses out of the leaf

## Structural adaptations in plants

- stomata, that occur mostly on the underside of leaves
- surrounded by guard cells, which help to open and close the stomatal pore, which this limits water loss
- air spaces between mesophyll cells



## Light compensation point (Fig 4, page 138)

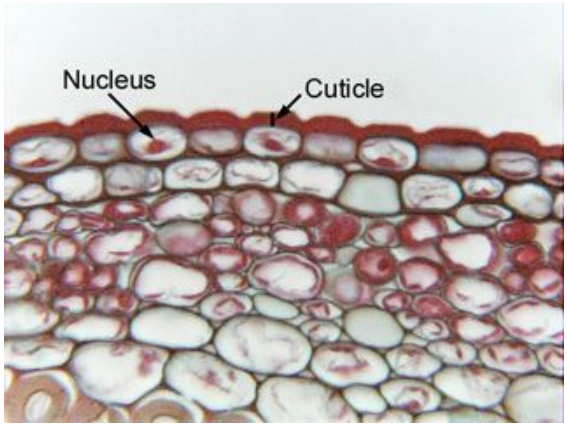


## Limiting water loss in plants

Plants lose water through their stomata - transpiration

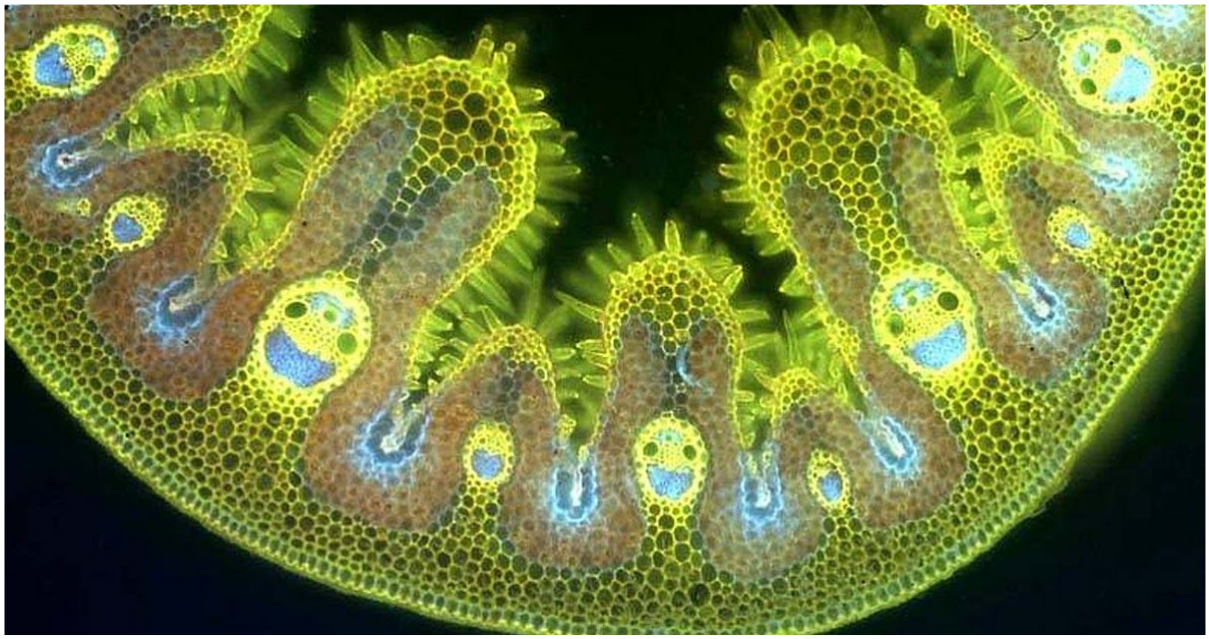
Plants adapted to limit water loss - xerophytes

### 1. A thick cuticle e.g. succulents




A thick waxy cuticle prevents transpiration from the upper surface of the leaf, which is often directly exposed to sunlight

## 2. Rolling up of leaves & 3. Stomata in pits or grooves = marram grass and pine leaves



Traps a region of still air, which becomes saturated with water vapour. Reduces the water vapour potential gradient between the inside of the leaf and the outside.

## 4. Hairy leaves e.g. heather

Traps still moist air close the leaf surface and reduces the water vapour gradient between the leaf and the outside.

## 5. Spiny leaves

Reduces surface area of diffusion. Chloroplasts often located in stem (fleshy) instead of leaves - so water only needs to travel from roots to stem

## Other adaptations

### a. Mangroves  - aerial roots

Mangroves live in salt marshes. Their roots are often covered in water. Roots need oxygen from air, for respiration and active transport of mineral ions. uMangroves grow aerial roots that grow vertically from the main root, and are exposed to air at all time.

### b. Plants in sandy soil

Water drains very quickly in sandy soil. Plants living in these areas either have very deep roots, or shallow roots than cover a large surface area

# Digestion - self-study