

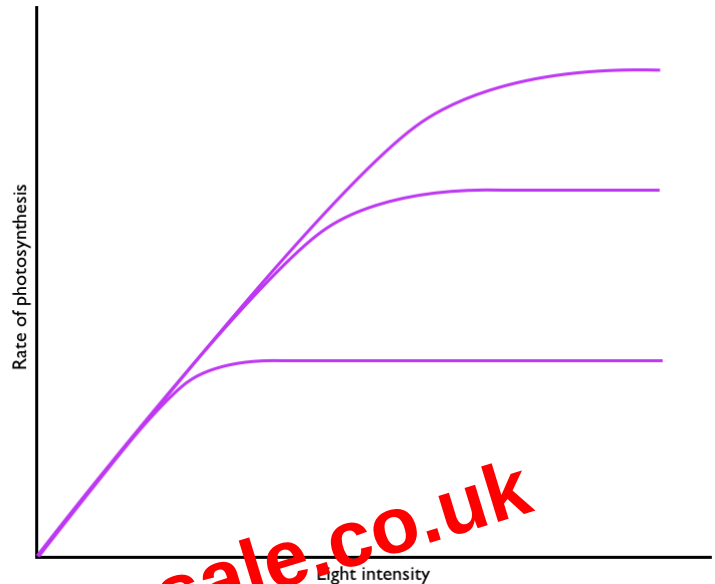
Factors affecting photosynthesis

Limiting factors

- A **limiting factor** is one which limits the rate of a process- is at the least favorable level.
- **At any given moment, the rate of a physiological process is limited by the factor that is at its least favorable value.**

Light intensity

- When light is the limiting factor, the rate of photosynthesis is directly proportional to light intensity.
- As it increases the rate of oxygen produced and carbon dioxide absorbed due to photosynthesis will increase to the point where it is **directly balanced** by the oxygen absorbed and carbon dioxide produced.
- At this point there will be **no net exchange of gasses** in and out of the plant- **the light compensation point**.
- Further increases in light intensity will cause a proportional increase in the rate of photosynthesis- rate of oxygen release and carbon dioxide absorbance
- A point will be reached where no further increases in light intensity will increase the rate of photosynthesis- concentration of carbon dioxide or temperature affecting it here.



Carbon dioxide concentration

- Carbon dioxide **needed in respiration** but **affects enzyme activity**- e.g. enzyme that catalyses the joining of carbon dioxide and RuBP so can be a limiting factor at too high concentrations

Temperature

- Rate of photosynthesis **increases in direct proportion to the temperature** up to about 25 degrees
- After this rate **declines due to enzyme denaturation** (proves that the process is not entirely photochemical)
- So temperature a limiting factor