5. Tabulate three differences between photosynthesis and respiration.

| Photosynthesis | Respiration |
|---|---|
| | |
| | |
| | |

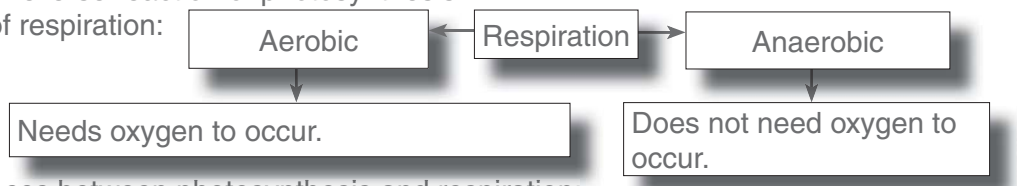
## Summary

- Plants are autotrophs – can produce own food.
- Photosynthesis: Green plants and some microorganisms
  Use sunlight, water, $CO_2$.
  Produce glucose ($C_6H_{12}O_6$) and $O_2$.
  In green plants: sunlight + $CO_2$ + $H_2O$ + chlorophyll → glucose + $O_2(\uparrow)$

$$CO_2 + H_2O \xrightarrow[\text{light energy}]{\text{chlorophyll}} (C_6H_{12}O_6) + O_2(\uparrow)$$

carbon dioxide — water — glucose — oxygen

- Chlorophyll makes absorption of light energy possible.
- Gaseous exchange (absorption and emission of gases) occurs through the stomata on the parts of the plant above ground.
- Water in the soil is absorbed through the root hairs of the roots.
- Energy from glucose: Make life processes possible.
- Glucose: Stored as starch.
  Stored starch → food source for other organisms.
- Respiration is the process whereby energy is released from food.
- The simplified chemical reaction for respiration:
  glucose + $O_2(\uparrow)$ → energy + $CO_2(\uparrow)$ + $H_2O$
- Respiration: reverse reaction of photosynthesis
- Two types of respiration:




- The differences between photosynthesis and respiration:

| Photosynthesis | Respiration |
|---|---|
| • Only takes place in plants.<br>• Oxygen and sugar is formed during the process.<br>• Photosynthesis needs sunlight.<br>• Food is produced.<br>• Energy is stored.<br>• Only takes place in cells that contain chlorophyll.<br>• An anabolic (constructive) metabolic process | • Takes place in plants and animals.<br>• Water and carbon dioxide are formed during this process.<br>• Respiration does not need light.<br>• Food is broken down.<br>• Energy is released.<br>• Takes place in all living cells.<br>• A catabolic (destructive) metabolic process |