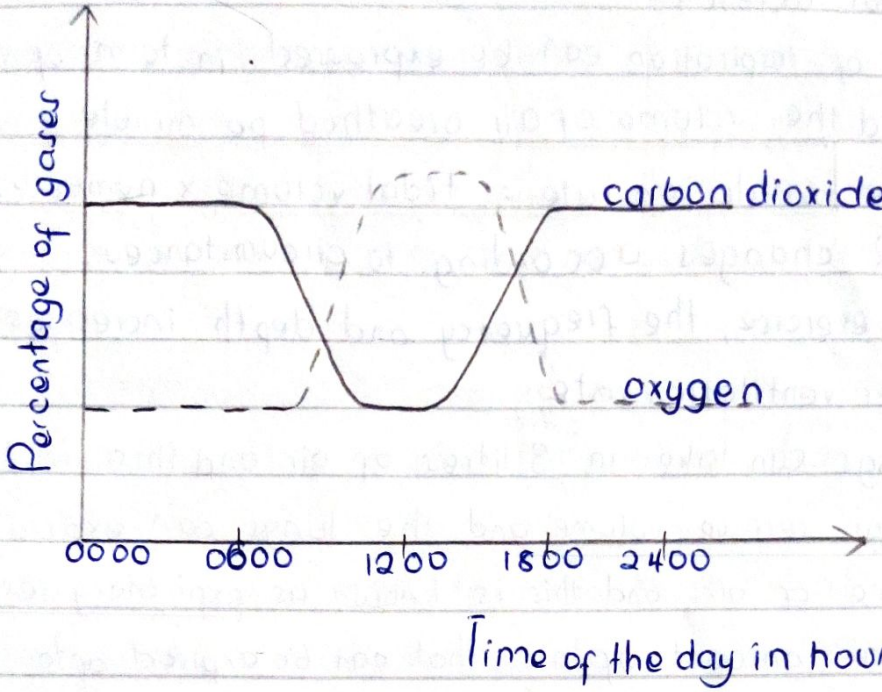
Closing of the stoma.
At night there is little or no photosynthesis and the sugar is converted into starch which is insoluble with no osmotic effective.

The guard cells lose water to the epidermal cells through osmosis. thereby making the cells flaqid and the inner cells closer and the stoma closes.

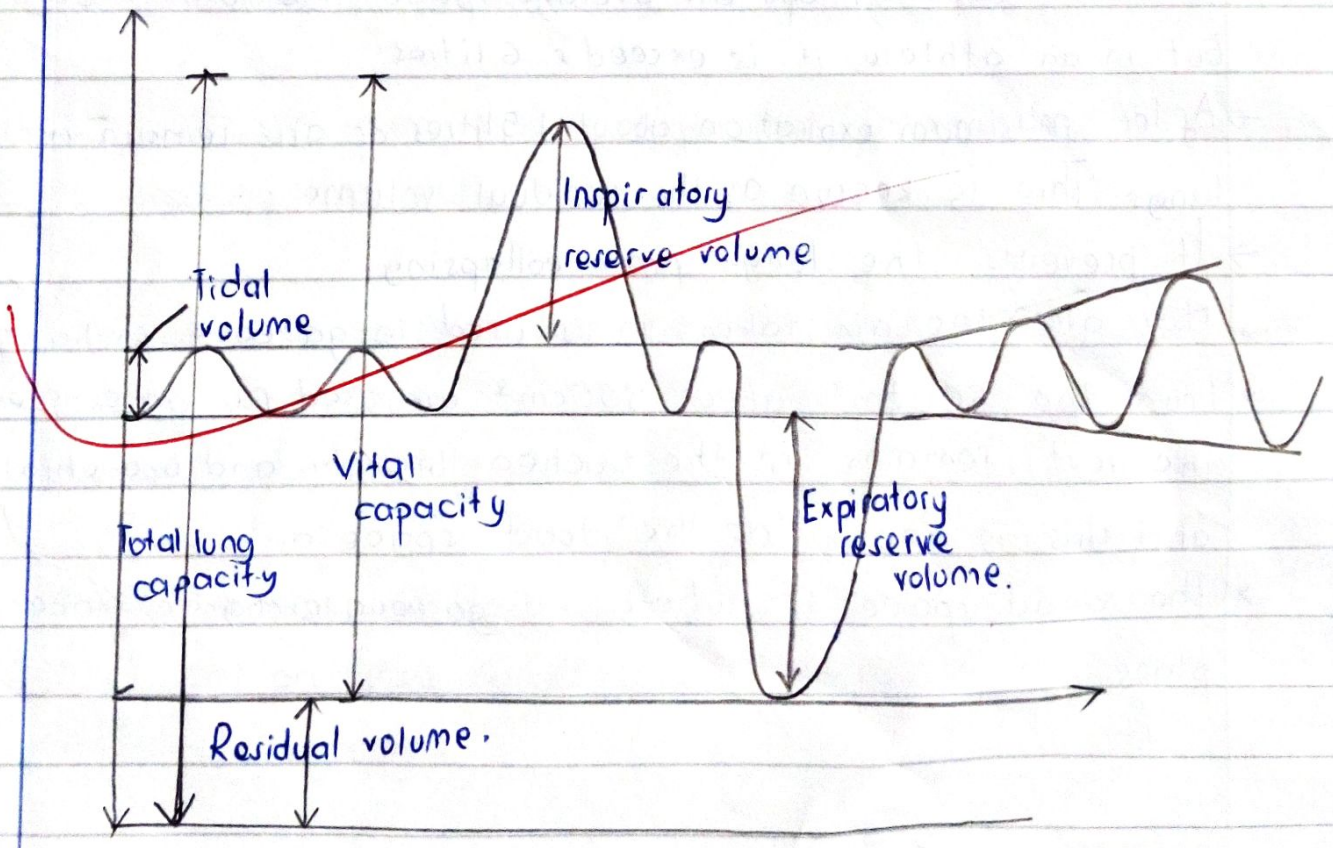
DIURNAL VARIATION IN THE PLANT ENVIRONMENT.

i. In plants, the amount of carbon dioxide in and around the leaves varies with time of the day.
ii. This is because of the effect of light and darkness on the processes like photosynthesis and respiration.
iii. During the day, when there is light, plants take in carbon dioxide for photosynthesis while animals are respiring.
iv. However, the rate of photosynthesis is higher than the rate of respiration so there is loss carbon dioxide in the atmosphere.
v. At this point, there will be more oxygen in the atmosphere since oxygen is a by-product of photosynthesis.
vi. At night, there is no photosynthesis but there is respiration so the amount of carbon dioxide rises where as that of oxygen reduces.
vii. This is why it is not advisable to have plants in the bedroom

A graph showing variation of gases in the atmosphere with time.



BREATHING CYCLE.



A person breathing normally at rest takes in and expels approximately ½ a litre (500cm³) of air during each respiratory cycle.

→ This is known as the tidal volume (volume of air breathed in and out at rest.)

→ The rate of respiration can be expressed in terms of ventilation rate and the volume of air breathed per minute.

Therefore ventilation rate = tidal volume x number of breaths/minute

→ The V.R changes according to circumstances.

→ During exercise, the frequency and depth increases therefore a greater ventilation rate

→ The lungs can take in extra 3 litres of air and this is known as inspiratory reserve volume. and the lungs can expire about 1 more extra litre of air and this is known as expiratory reserve volume.

→ The total amount of air that can be expired after maximum inspiration is known as the vital capacity.

→ The vital capacity includes the tidal volume + the inspiratory reserve volume + expiratory reserve volume

→ The vital capacity of an average person lies btn 4-5 litres but in an athlete, it is exceeds 6 litres.

→ After maximum expiration about 1.5 litres of air remain in the lungs. This is known as the residual volume.

→ It prevents the lungs from collapsing.

→ Not all the air taken in is used in gaseous exchange.

→ From the 500cm^3, about 350cm^3 are used for gaseous exchange. the rest remains in the trachea bronchi and bronchioles. and this is known as the dead space air.

→ The dead space is where no gaseous exchange takes place.

Revision question.

1. Explain why:

i. Expired air contains more carbon dioxide than ~~expired air~~ inspired air.

ii. Expired air contains more oxygen than inspired air.

iii. Expired air contains the same amount of nitrogen as inspired air.

iv. Water vapour in both inspired and expired air varies.

v. Expired air is at a higher temperature than inspired air in man.

b) Describe an experiment to show that exhaled air contains more carbon dioxide than inspired air.

1. Expired air contains more carbon dioxide than inspired air because carbon dioxide is produced by the body as a by-product.

2. Expired air contains less oxygen than inspired air because oxygen is used by the body.

3. Expired air contains ~~less~~ the same amount of nitrogen as inspired air because nitrogen is neither produced ~~nor~~ as a by product nor used by the body.

4. Water vapour in both inspired and expired air varies because it is ~~pro~~ produced as a by product and at the same time used by the body.

5. Expired air is at a higher temperature than inspired air because as air passes through the nose which helps to warm air.