

SAA LECTURE No S3

RESPIRATION & CIRCULATION



METABOLISM

FOOD + OXYGEN= ENERGY +CO₂+WASTE

LUNGS – BREATHING IN

RIBS RAISE – DIAPHRAGM DEPRESSES – LUNGS EXPAND – AIR DRAWN IN

LUNGS – BREATHING OUT

RIBS RETURN – DIAPHRAGM RELAXES LUNGS RETURN TO ORIGINAL VOLUME – AIR EXPELLED

Composition Of Air INHALED

79% NITROGEN (N₂)
20% OXYGEN (O₂)
1% INERT GASES

EXHALED

79% NITROGEN (N₂)
16% OXYGEN (O₂)
4% CARBON DIOXIDE (CO₂)
1% INERT GASES

Composition Of Lungs

Windpipe splits into two pipes called bronchi. These in turn split into numerous pipes called bronchioles. (Imagine a head of broccoli and you have the idea of the lung). At the end of each bronchiole there are small air sacs called alveoli. On the surface of these air sacs are capillaries where the exchange of gases into the blood stream takes place.

DO NOT HOLD BREATH WHEN ASCENDING – OR ALVEOLI WILL RUPTURE (BOYLES LAW)

Composition Of Heart

Four chambers: Right and left ventricles and right and left atriums. (Think of atriums as collecting chambers and ventricles as pumping stations). Blood is constantly circulating around the body. Blood enters the heart after journey round body, CO₂ enriched – into right atrium, passing into the right ventricle where it is pumped at low pressure through the pulmonary artery to the lungs, where it passes over the capillaries of the alveoli and is replenished with O₂ and the CO₂ is expelled through the airways. The blood then passes back towards the heart via the pulmonary vein and into the left atrium; it then passes into the left ventricle where it is pumped at high pressure to all areas of the body via the aorta. On this journey it visits all the organs, muscles, etc. and deposits oxygen and energy to them all. Thus the process of replenishment begins all over again.

VITAL ORGANS:

Heart-Brain-Liver-Kidneys-Lungs

Other Associated Problems

HYPERVENTILATION

Over breathing

HYPOXIA

Partial lack of oxygen

ANOXIA

Total lack of oxygen

EXHAUSTION

Extreme Tiredness due to overwork

DROWNING

Death due to fluid on the lungs

NEAR DROWNING

Diver becoming unconscious, due to the inability to breathe because being immersed in fluid.