

With the gill lamella blood flow flowing opposite to the flow of water between the lamella, it allows for an efficient gas exchange through the counter-current system. With the counter-current system there is a diffusion gradient favouring the diffusion of oxygen from the water into the blood all the way across the gill lamella. Almost all oxygen from water diffuses into blood.

Gas exchange in humans:

Mechanics of breathing:

Inspiration – active process

- 1. External intercostal muscles contract, builting the ribcage upwards and outwards
- 2. Diaphragm careacts pulling it from a care of a flattened
- The combined effect of these:
 - Volume of thorax and lungs increase
 - Pressure is reduced
 - Air enters, following the pressure gradient

Expiration – passive process

- 1. External intercostal muscles relax, and the ribcage falls under its own weight
- 2. Diaphragm relaxes and gut pressure pushes it back into domed shape
- 3. Elastic recoil of lung tissue
- The combined effect of these:
 - Volume of the thorax and lungs decrease
 - Pressure is increased
 - Air is forced out

Expiration forced – active process

- 1. Internal intercostal muscles contract, pulling the ribcage down and in
- 2. Abdominal muscle contracts pushing the diaphragm upwards

ribcage Inattened



Tissue fluid:

Constituent parts of blood: WBCs, RBCs, platelets, plasma

Substances found in blood: oxygen, water, carbon dioxide, glucose, urea, lipids, amino acids, lactic acid.

Tissue fluid – fluid that contains important substances for cells, that bathes cells and allows exchanges of substances between the blood and the cells

