

Breathing

The physical explanation

Nature abhors a vacuum and an imbalance of pressure.

When we breathe in, the cubic capacity of our chest cavity is increased and this reduces the pressure inside our lungs, making it lower than that of the air pressure outside our body. Consequently air rushes into the lungs through the nose and mouth until the pressure is equal inside and outside the body.

When we breathe out the reverse happens. The cubic capacity of the lungs is reduced. The pressure inside therefore increases and so air rushes out until equilibrium is regained.

How and why does this happen?

On breathing in: the muscles between the ribs contract, moving the ribs upwards and outwards, and **more importantly**, the diaphragm contracts (it is the largest muscle in the body that is stretched across the bottom of the chest cavity dividing it from the abdomen) which makes it move downwards. This in turn forces the stomach and intestines downwards and abdominal muscles outwards to accommodate the change. The result is an increase in the size of the chest cavity (or thorax).

See diagram A - Inhale

On breathing out: the muscles between the ribs relax and the ribs move inwards and downwards and **more importantly** the diaphragm relaxes returning upward to its normal curved position allowing the stomach muscles back into a flatter position. This effectively reduces the size of the chest cavity.

See diagram B - Exhale

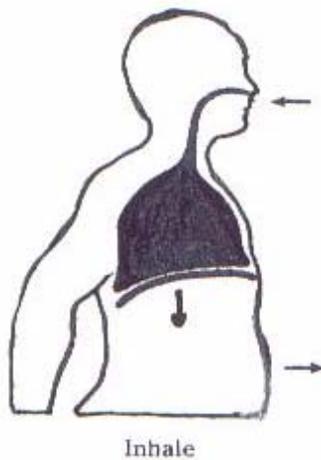


Diagram A

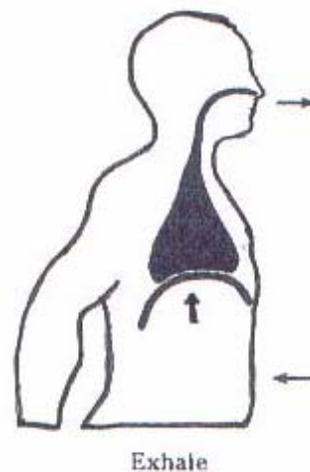


Diagram B