Paper 1: Respiratory system

The Mechanics of Breathing

In order for us to get oxygen into our bodies, we have to breathe. Outlined below are the mechanics of how we breathe:

		Expiration	Inspiration
Intercostal Muscles	External	Relax	Contract
	Internal	Contract	Relax
	Ribs	Lower	Rise
	Diaphragm	Relaxes into dome shape	Contracts and flattens
	Lung Volume	↓	↑
	Air pressure in lungs	↑	↓
	Air pressure is relatively high in...	The lungs	The environment

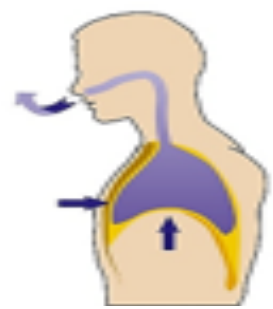
Expiration: air out

As air pressure in the lungs increases, it forces air out of the lungs.

Inspiration: air in

As air pressure in the lungs decreases, air is sucked into the lungs.

As we exercise, the abdominal muscles support expiration by pulling the ribs down more forcefully so air can be pushed out more quickly.	As we exercise, the pectoral and sternocleidomastoid muscles support inspiration by allowing the lungs to expand and take in more oxygen.



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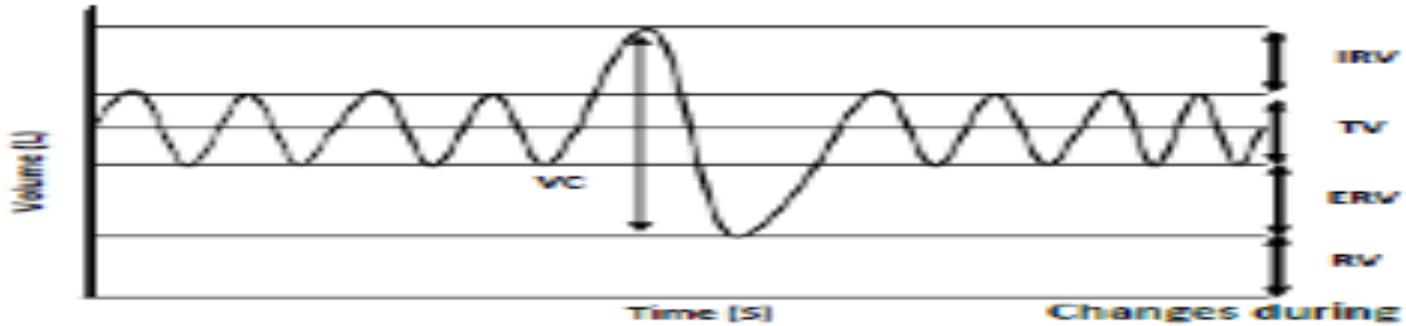
Respiratory System During Exercise

A spirometer trace shows the volume of air inhaled and exhaled

Spirometer trace at rest



		Changes during Exercise:
TV	Tidal Volume: normal amount of air inspired/expired	↑
ERV	Expiratory Reserve Volume: amount of air forced out after tidal volume	↓
IRV	Inspiratory Reserve Volume: amount of air forced in after tidal volume	↓
RV	Residual volume: the air left in the lungs prior to maximal expiration	No change
VC	Vital Capacity: largest volume of air that can be forcibly expired following largest inspiration	

Spirometer trace during exercise