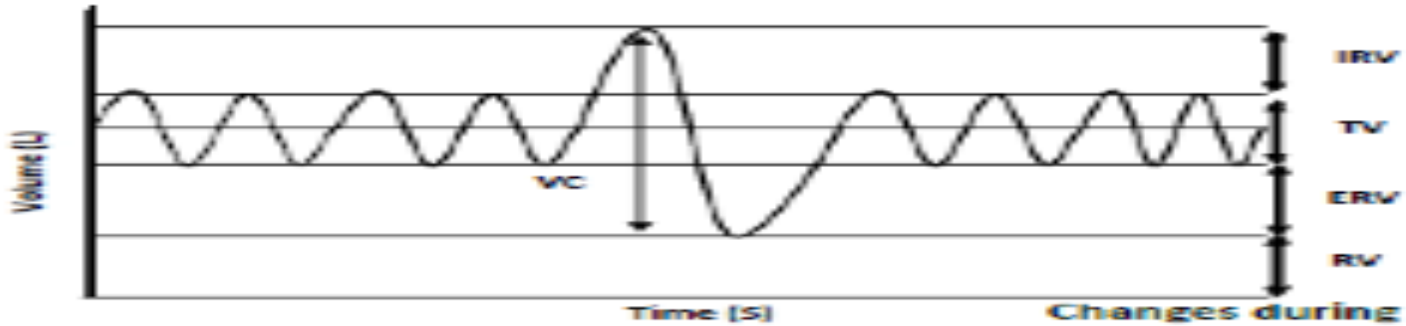
Paper 1: Respiratory system

Respiratory System During Exercise

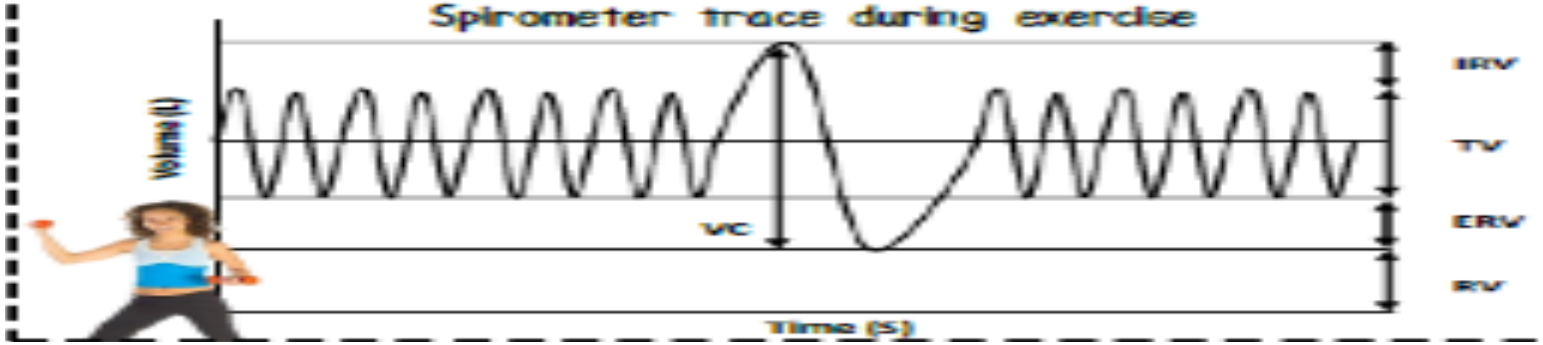
A spirometer trace shows the volume of air inhaled and exhaled

Spirometer trace at rest

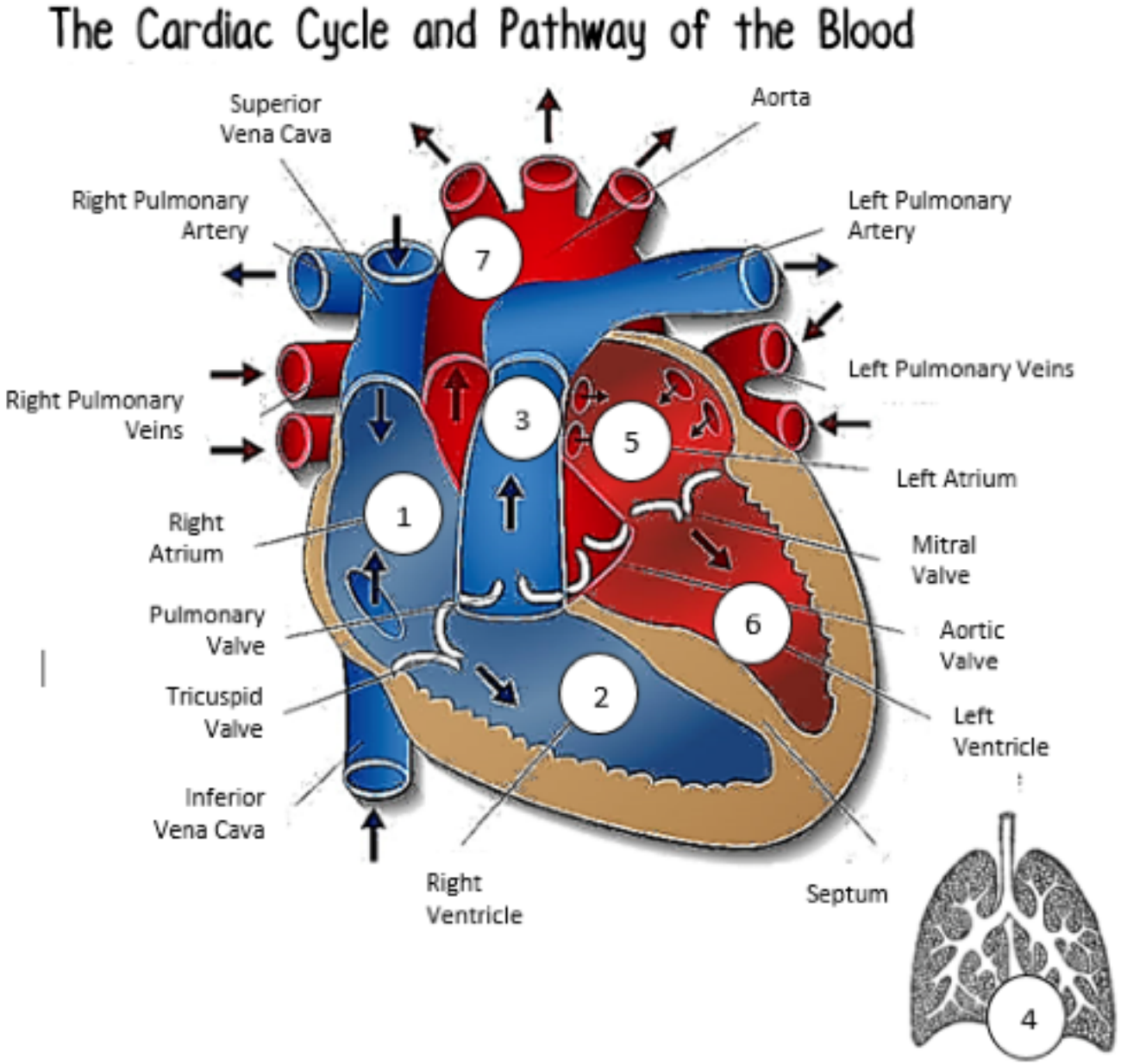


		Changes during Exercise:
TV	Tidal Volume: normal amount of air inspired/expired	↑
ERV	Expiratory Reserve Volume: amount of air forced out after tidal volume	↓
IRV	Inspiratory Reserve Volume: amount of air forced in after tidal volume	↓
RV	Residual volume: the air left in the lungs prior to maximal expiration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

Spirometer trace during exercise



Paper 1: Cardiac system



The blood fills the heart during **diastole** and is pumped out of the heart during **systole**. The flow of blood between different structures is controlled by valves which allow blood under high pressure to flow through them, but prevent it from flowing in the opposite direction.

Blood is pumped around the heart and to the lungs in the order outlined below and on the diagram:

1. **Deoxygenated** blood flows into the **right atrium.**
2. The blood passes into the **right ventricle** (as atrioventricular valves are open).
3. The right ventricle contracts to force blood out of the heart to the **lungs** via the **left pulmonary artery**.
4. At the lungs, gaseous exchange occurs and **oxygen** is taken up by the blood. The blood becomes **oxygenated.**
5. The **oxygenated blood** is transported back to the **left atrium** via the **pulmonary vein.**
6. The blood then flows into the **left ventricle** (as atrioventricular valves are open).
7. The blood is pumped out of the heart and transported to the **body** via the **aorta**.

The valves of the heart open due to the pressure of the blood filling the atria. They close to prevent backflow of blood.