

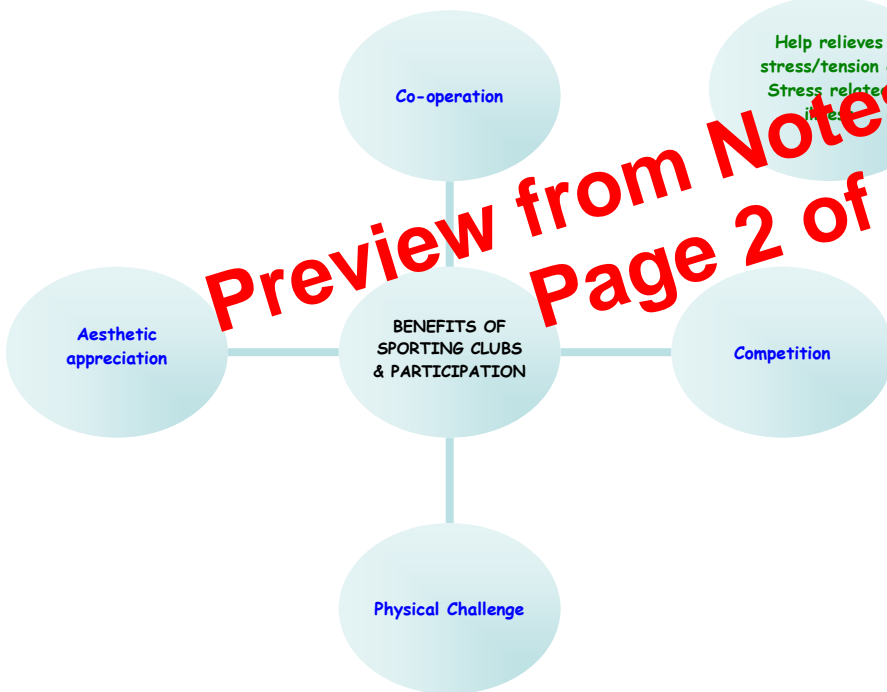


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**GCSE PHYSICAL EDUCATION
REVISION BOOKLET 2012**

1.1 Healthy, active lifestyles

1.1.1 Reasons for taking part in activity



SOCIAL	MENTAL	PHYSICAL
<ul style="list-style-type: none"> • Make new friends • Social mixing • Meet current friends • Develop teamwork + co-operation 	<ul style="list-style-type: none"> • Helps relieves stress/tension • Help individual feel good • Mental challenge (can I do it?) + competition • Increase self-esteem + confidence • Contribute to life enjoyment • Aesthetic appreciation 	<ul style="list-style-type: none"> • Helps individual to feel and look good • Enhances body shape • Contributes to good health and enjoyment of life • Physical challenge (can I do it) • Competition

1.2.2 - THE CARDIOVACULAR SYSTEM DURING EXERCISE

KEY TERMS

- **Heart Rate (HR)** - the amount of beats per minute
- **Stroke Volume (SV)** - the amount of blood pumped by heart in one beat
- **Cardiac Output (CO)** - the amount of blood pumped by the heart per minute

$$CO = SV \times HR$$

WHAT ARE ARTERIES, VEINS & CAPILLARIES?

Arteries:

- Thick, flexible vessel walls
- Has a pulse. No valves
- Work under high pressure
- Transports blood away from heart (**OXYGENATED**)
- Narrow lumen

Veins:

- Thin walls
- Valves present; prevents backflow. No pulse
- Pulsating muscles close to veins prevent backflow- 'skeletal pump'
- Work under low pressure
- Transports blood towards the heart (**DEOXYGENATED**)
- Wide lumen

Capillaries:

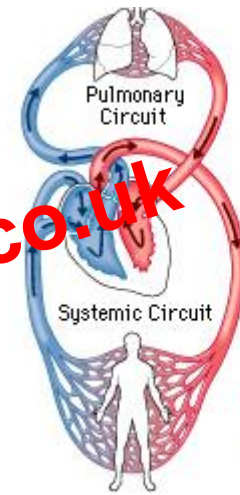
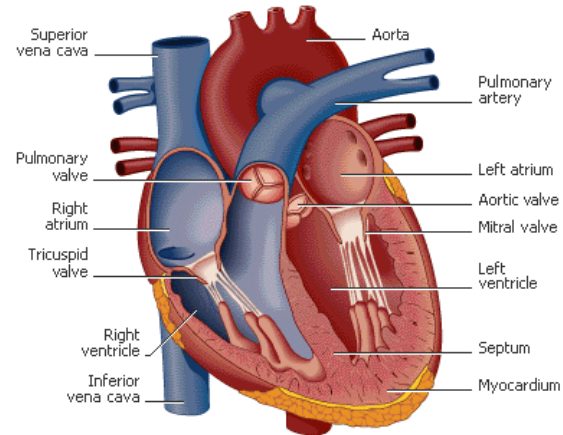
- Smallest of all vessels - walls one cell thick
- They are 'semi-permeable' - substances pass through
- At one end - they feed muscles, organs and body tissue with oxygen and nutrients
- At other end - carbon dioxide and waste products pass into veins to be removed
- They bring blood within reach of every cell

The 3 parts of the circulatory system are blood, heart and blood vessels



Diagram of the heart

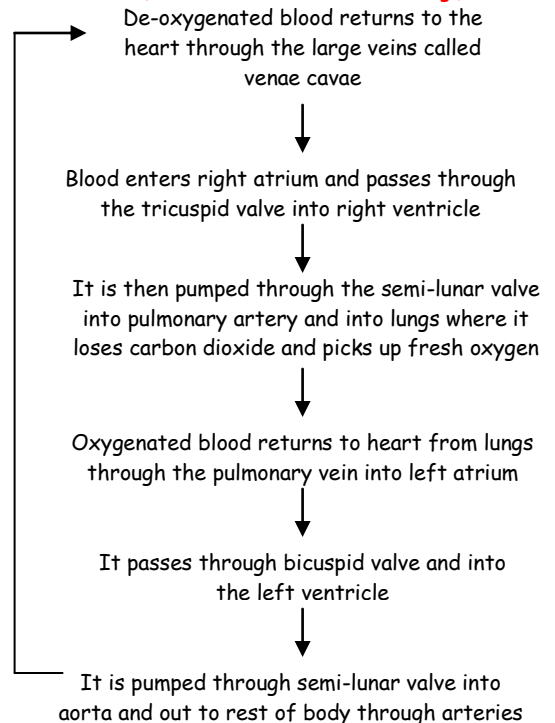
Labels for extra info!



Key:
■ = Oxygen rich, CO₂- poor blood
■ = Oxygen poor, CO₂- rich blood

THE FLOW OF BLOOD

(for info + extra understanding!)



Immediate Effects of Exercise	Effects of Regular Training	Long Term Benefits
<ul style="list-style-type: none"> ✓ Heart Rate increases ✓ Cardiac Output & Stroke Volume increases ✓ Blood Pressure increases ✓ Increase of Blood to working muscles - blood shunting ✓ Vasodilation ✓ Lactic acid builds up + muscles ache ✓ Body temp increases 	<ul style="list-style-type: none"> ✓ Bigger & Stronger heart ✓ Lower Resting Heart Rate ✓ Increased Cardiac Output & Stroke Volume ✓ Lower systolic + diastolic Blood Pressures ✓ More Blood Vessels - Capillarisation ✓ Faster recovery rate 	<ul style="list-style-type: none"> ✓ Helps prevent coronary heart disease ✓ Helps prevent Type 2 diabetes ✓ Helps prevent Cardiovascular Disease ✓ Helps prevent Obesity ✓ Healthy veins & arteries - more elastic ✓ Increases ratio of HDL: LDL

1.2.3 - THE RESPIRATORY SYSTEM

KEY TERMS

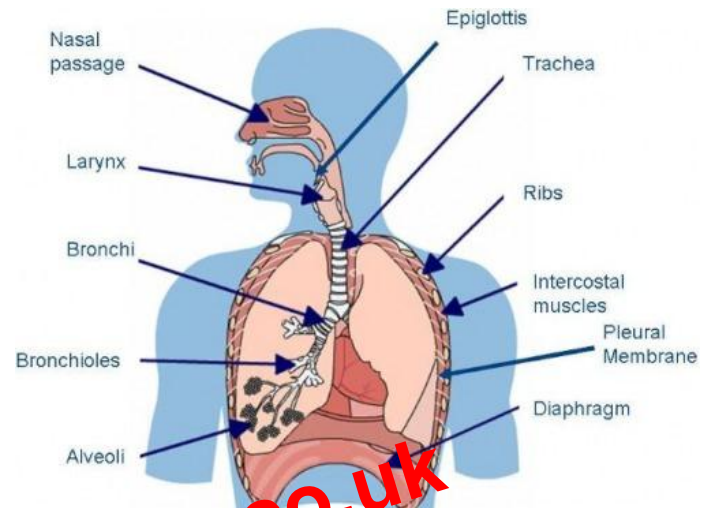
- **Oxygen debt** - Shortfall of oxygen to the body after maximal effort/anaerobic exercise, resulting in deep and shallow breathing e.g. at end of 400m race
- **Vital Capacity** - The maximum amount of air that can be forcibly exhaled after breathing in as much as possible
- **Tidal Volume** - Amount of air breathed in or out at rest

The 3 parts of the respiratory system are the diaphragm, lungs and air passages

THE RESPIRATORY SYSTEM

The function of the respiratory system is;

- To get oxygen into the body
 - To remove carbon dioxide out of the body
- Oxygen is used by the body to release energy and carbon dioxide is released so it doesn't build up and poison the body



MECHANISM OF BREATHING (For info/extra understanding!)

Lungs are not muscles therefore can't move on their own accord. They are helped by the *diaphragm* and *intercostal muscles* between the ribs.

- | | |
|--|--|
| <p>When we breathe in -
Inspiration - the following happens...</p> <ul style="list-style-type: none"> • Our diaphragm pulls down • Our intercostal muscles contract • Air pressure is reduced • Air is sucked through the tubes into lungs • Our chest expands | <p>When we breathe in -
Expiration - the following happens...</p> <ul style="list-style-type: none"> • Our diaphragm relaxes • Our intercostal muscles relax • Our chest becomes smaller • Pressure increases on the lungs • Air is forced out |
|--|--|

WHAT IS LACTIC ACID?

- Lactic acid is a by-product of exercise. A build up of this can inhibit performance and cause pain, discomfort and fatigue.
- Lactic acid occurs in the anaerobic system because without the presence of oxygen, pyruvic acid turns to lactic acid.
- Cooling down properly with stretching helps the lactic acid be removed and prevents aching muscles after the exercise.

AEROBIC and ANAEROBIC ACTIVITY

AEROBIC - with oxygen

- Lower intensity
- Endurance activities - Marathon

ANAEROBIC - without oxygen

- Higher intensity
- Short distance activities - Sprinting

DAMAGE BY SMOKING/NICOTINE

IMPAIRS GASEOUS EXCHANGE

- * Damages lungs
- * Makes alveoli less stretchy i.e. less efficient
- * More difficult to O₂ in and CO₂ out
- * Hearts have to work harder → athlete feels more tired

Immediate Effects of Exercise	Effects of Regular Training
<ul style="list-style-type: none"> ✓ Breathing deepens ✓ Breathing quickens ✓ Oxygen Debt (result from anaerobic exercise) ✓ Increase in tidal volume 	<ul style="list-style-type: none"> ✓ Improved efficiency of lungs → more efficient delivery of O₂ and removal of CO₂ ✓ More alveoli ✓ Improved VO_{2max} ✓ Increased vital capacity ✓ Increased tidal volume ✓ Faster recovery rate