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**Highsted Knowledge Organiser**

**GCSE Sport Studies**



**Chapter 1b - The structure and function of the cardio-respiratory system**

What I need to know:

- A. Understand the pathway of air into and out of the lungs.
- B. Understand gas exchange at the alveoli and the features that assist in gaseous exchange
- C. Understand the structure and function of arteries, capillaries and veins
- D. Understand the structure of the heart
- E. Understand the order of the cardiac cycle and the pathway of the blood through the heart
- F. Understand the term cardiac output, stroke volume and heart rate, and the relationship between them
- G. Understand the mechanics of breathing as the interaction of the intercostal muscles, ribs and diaphragm
- H. Understand and interpret lung volumes through spirometer traces

Key Vocabulary:

- Trachea, Bronchi, Bronchioles, Lungs, Alveoli
- Gaseous exchange (B)
- Diffusion (B)
- Haemoglobin & Oxyhaemoglobin (B)
- Inspiration & expiration (G)
- Tidal volume, Inspiratory Reserve Volume, Expiratory Reserve volume, Residual Volume (H)
- Spirometer trace (H)
- Artery, vein, capillaries, vasoconstriction & vasodilation (C)
- Atria, ventricles, diastole, systole, cardiac cycle (D&E)
- cardiac output, stroke volume (F)



Student reference point:



Can you describe the pathway of air through the respiratory system and explain which muscles contract to allow the inspiration and expiration process.

Which muscles engage during exercise to allow more air in to the lungs?

Complete this quiz on the respiratory system.



<https://www.bbc.co.uk/bitesize/guides/zpd4wxs/test>

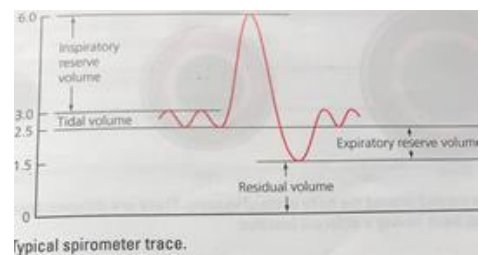


Watch this clip on gaseous exchange from Teach PE



<https://www.youtube.com/watch?v=CM6wrjTrtjk>

Can you label this diagram and explain what would happen to the TV, IRV & ERV during exercise?



Challenge question:

Explain the terms cardiac output and stroke volume and the relationship between them.

Careers in Sport: <https://www.bbc.co.uk/bitesize/articles/zmfkrj6>



Ch1B – Cardio respiratory system - heart and lungs:

What to know about cardiorespiratory endurance:

- <https://www.medicalnewstoday.com/articles/325487>



There's no limits to the cardiovascular benefits of exercise

<https://www.healthline.com/health-news/theres-no-limit-to-the-cardiovascular-benefits-of-exercise>

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Chapter 2: Movement Analysis

What I need to know:

- A. Understand the different classes of levers found in the body
- B. Understand the mechanical advantages of different lever systems
- C. Understand how muscles work to cause movements
- D. Understand the planes and axes of different movements
- E. Understand the types of movements that occur at different joints
- F. Understand the names of the muscles causing movements at different joints

Key Vocabulary:

- Levers – 1<sup>st</sup>, 2<sup>nd</sup> and third class(A)
- Pivot, lever, fulcrum, effort and load (A)
- Mechanical advantage(B)
- Antagonistic and agonist muscle action(C)
- Isometric, Isotonic, eccentric and concentric(C)
- Sagittal, frontal, transverse planes(D)
- Transverse, sagittal, longitudinal axes(D)
- Flexion/extension/rotation/abduction/adduction
- Plantarflexion and dorsiflexion



Student reference point:

**META-THINKING** Can you recall what the following means?  
**1 F**  
**2 R**  
**3 E**

<https://www.bbc.co.uk/bitesize/guides/zxkr82p/revision/1>  
 Can you think of the reason why a lever has a mechanical advantage?  
<https://www.youtube.com/watch?v=mw9aEh-cT30>

**REALISING** Learn and revise the main muscles in the body

**EYES** Remember SquaT From side to Side Twirl

**Planes of Movement and Axes of Rotation**

Axis	Plane
Longitudinal	Transverse
Transverse	Sagittal
Sagittal	Frontal

*Exam Tip! Make sure you remember these key words!*

PLANE	MOTION	AXIS	EXAMPLE
Sagittal	Flexion/extension	Transverse	Running, squats, biceps curl, leg extensions, front somersault
Frontal	Abduction/adduction	Sagittal	Star jump, cartwheel, side-bending
Transverse	Rotations	Longitudinal	Throwing, 360° twist, ice-skating spin, golf swing

Challenge question:

Select a skill or movement from an activity you will be assessed in. Can you identify the levers involved in the movement. Which plane and axis is involved in the primary movement. How do the muscles work together to produce co-ordinated movement? Use muscle terminology to add depth to your answer.



Careers in Sport: Biomechanics in sport <https://www.youtube.com/watch?v=-W9hsx1jmcc>