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Highsted Knowledge Organiser

GCSE Sport Studies



Chapter 1b - 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 (A)
- 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?

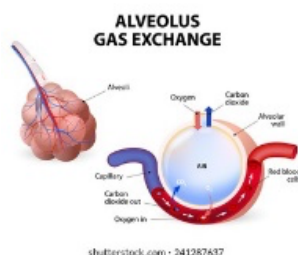
Complete this quiz on the respiratory system.



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

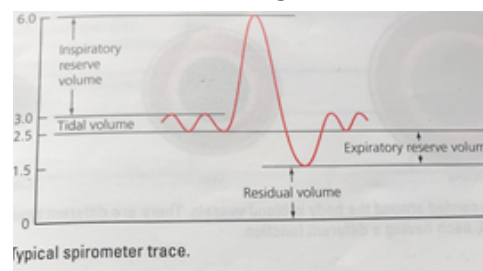


Watch this clip-on gaseous exchange from Teach PE



<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 1c: Aerobic and Anaerobic Exercise



What I need to know:

- A. Understand the idea of aerobic and anaerobic exercise *during differing intensities*.
- B. Describe how EPOC/oxygen debt is caused by anaerobic exercise and understand the recovery process from vigorous exercise in terms of excessive post-exercise oxygen consumption
- C. Understand the methods used to help recover from strenuous exercise
- D. Understand the immediate effects of exercise (during exercise)
- E. Understand the short term effects of exercise (24-36 hours after exercise)
- F. Understand the long term effects of exercise (months and years of training)

Key Vocabulary:

- Aerobic exercise (A)
- Anaerobic exercise (A)
- Delayed onset of muscle soreness (DOMS).(B/D)
- Oxygen debt(B/D)
- Excess Post exercise Consumption (EPOC)(B/D)
- Ice baths(C)
- Massage (C)
- Rehydration(C)
- Cool down (C)
- Nausea (E)
- Cramps (E)
- Hypertrophy(F)
- Bradycardia (F)



Student reference point:



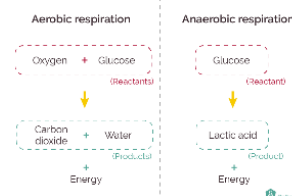
Can you define aerobic and anaerobic exercise along with practical examples of sporting situations which rely on each type of exercise.

Watch this clip to see how sports use both energy pathways.

<https://www.youtube.com/watch?v=y3DbG78EEK4>



Can you recall the energy equations?



Complete the following quiz questions.

<https://www.bbc.co.uk/bitesize/guides/zghmp39/test>

<https://www.teachpe.com/quizzes/aerobic-anaerobic-exercise>



Watch this clip on aerobic and anaerobic pathways from The Everlearner

https://www.youtube.com/watch?v=Jc73f_jxjWo
<https://www.youtube.com/watch?v=1R09dDZUNSo>

links with Chapter 3: Physical Training



Why do we get an oxygen debt after strenuous exercise?

Challenge question:

Why might body shape change following repeated exercise? (synoptic question)



Suggested reading (library)



Swimming- Helene, Boudreau
Cycling- Mason Paul
Conditioning for dance- Eric, Franklin

- Dancing shoes- Noel Streatfield
- A lifetime in a race- Matthew Pinsent
- Sweet Hearts: Deep Water- Jo Cotterill
- Swimming against the tide- Helen Bailey
- the weight of water- Sarah Crossan
- Running like a girl- Alexandra Heminsley

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Chapter 6 – Health and fitness



What I need to know:

- I. Linking participation in physical activity, exercise and sport to fitness, health and well-being
- J. How exercise can suit the varying needs of different people
- K. The consequences of a sedentary lifestyle
- L. Obesity and how it may affect performance in physical activity and sport
- M. The most suitable body type (somatotypes) for particular sports (or positions within a sport)
- N. How energy is gained from food and used
- O. Reasons for having a balanced diet
- P. The role of carbohydrates, fats, protein, vitamins and minerals
- Q. Reasons for maintaining a water balance

Key Vocabulary:

- Health & fitness (A)
- Physical, mental & social health (A, B)
- Sedentary lifestyle (C)
- Obesity (D)
- Somatotypes – ectomorph, endomorph & mesomorph (E)
- Nutrition – balanced diet (F, G)
- Vitamins & minerals (H)
- Hydration & rehydration (I)



Student reference point:



Watch this video that covers health and fitness and the relationship between the two from The everlearner

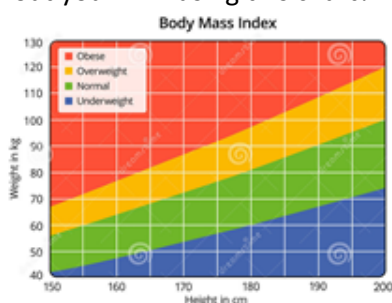
<https://www.youtube.com/watch?v=GiezIBTf168>

Complete these quizzes on the various health and fitness topics

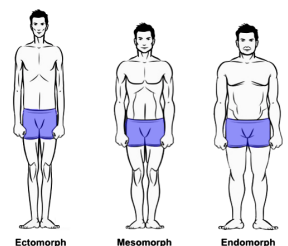
<https://www.bbc.co.uk/bitesize/topics/z9v3ycw>



Can you work out your BMI using this chart?



Can you list 5 sports that would be suitable for each somatotype? Explain why?



Challenge question:

General physical fitness varies from person to person. What are the long-term benefits of regular exercise?



Suggested reading (library)

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

Sports nutrition article:

<https://www.nutritionist-resource.org.uk/articles/sports-nutrition.html#whatissportsnutrition>

