

Name .....

Paper 1

Target Grade:

# GCSE PE

## *Chapter Support:*

*A&P – Exercise*



A simple booklet designed to support you  
chapter by chapter through GCSE PE

# Glossary

*Gaseous exchange* – the process that takes place in the alveoli in the lungs in which oxygen being taken in / being exchanged for the carbon dioxide which is to be breathed out

*Aerobic respiration* - respiration in the presence of oxygen

*Anaerobic respiration* - respiration in the absence of oxygen

*Lactic acid* - a waste product produced during anaerobic respiration

*Local Muscle Fatigue* – fatigue in the specific muscles being used

*Health* - physical, social and mental well-being not merely the absence of disease

*Fitness* – the ability to cope with the demands of the environment

*Excess Post-exercise Oxygen Consumption (EPOC)* – the amount of oxygen needed to recover after exercise

*Delayed Onset of Muscle Soreness (DOMS)* – the pain you feel in your muscles the day after exercise

*Vasodilation* – The widening of blood vessels to redistribute blood to the working muscles

*Vasoconstriction* – The narrowing of blood vessels to redistribute blood to the working muscles

# Aerobic and Anaerobic respiration

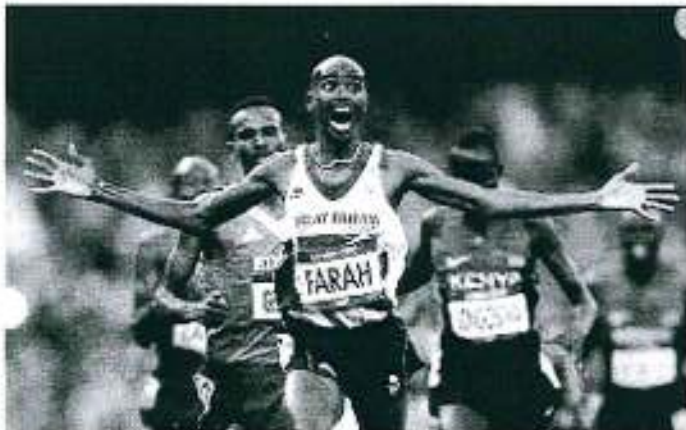
Complete the word equation for **aerobic respiration**.

+  →  +  +

carbon dioxide     energy     glucose     oxygen     water

## Task 1

- Cut out and complete the word equation for aerobic respiration using the key words.
- Draw your own word equation for anaerobic respiration to go under it in your book.



Task 2: Using the two athletes above and the key words in the table below, write an explanation as to why one of them will predominately create energy aerobically and one will create energy anaerobically. You must use the words underlined. EXT—Using the others will show a greater level of understanding

Oxygen debt	<u>Aerobic</u> <u>respiration</u>	<u>Lactic acid</u>	<u>Anaerobic</u> <u>respiration</u>
Glucose	Breathing rate	<u>Oxygen</u>	Painful



# Aerobic and anaerobic respiration in various sports

## Task

1 — Study the list below of different types of physical activity. Decide whether the activity uses more aerobic or anaerobic respiration. Write 'aerobic' or 'anaerobic' in the boxes provided.

a) Squash

b) Football

c) 200m running

d) Basketball

e) Long-distance swimming

f) Javelin throwing

g) Long jump

h) Long-distance cycling

i) Tennis

j) Netball

2 — Make a list of aerobic actions and anaerobic actions within a game of your choice in the spaces below.

**Sport:** \_\_\_\_\_

**Aerobic actions:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Anaerobic actions:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Homework on Recovery from Anaerobic Work

1. Fill in the gaps using the words below once, more than once or not at all. Complete in pencil first, then read the paragraphs to ensure they make sense.

Oxygen Debt    Heart Rate    Lactic Acid    Carbon Dioxide  
Oxygen    Glycogen    Chocolate    Bananas    Steak  
Aerobic    Anaerobic    Replace    Water    Air

During hard exercise \_\_\_\_\_ builds up in the muscles. It builds up because you are not using \_\_\_\_\_ to give you energy and you are respiring \_\_\_\_\_. Your muscles need \_\_\_\_\_ to get rid of the lactic acid.

The amount of \_\_\_\_\_ needed to get rid of the lactic acid is called ~~the~~ 'E P O C'. To get rid of this '\_\_\_\_\_' you gulp \_\_\_\_\_ into your lungs. This \_\_\_\_\_ contains the gas \_\_\_\_\_. The gas \_\_\_\_\_ breaks down the Lactic acid into \_\_\_\_\_ + \_\_\_\_\_ or \_\_\_\_\_.

### Recovery

During high intensity / anaerobic exercise muscle \_\_\_\_\_ gets used up so you must \_\_\_\_\_ it. Athletes snack on starchy foods like \_\_\_\_\_ to help replace stores.

Your \_\_\_\_\_ returns to normal after exercise

Answer the following exam style questions:

1. Describe the relationship between oxygen debt and lactic acid during intensive exercise (4 marks)
2. Describe how your body recovers after exercise and state one way in which a performer could speed up recovery. (4 marks)



# Immediate effects of exercise on the performer

## Task

Look at the illustration below, which lists the effects that exercise has on the body. Fill in the gaps to complete the sentences. Use the words from the word bank to help you.

a) The \_\_\_\_\_ reddens when blood vessels \_\_\_\_\_.

b) \_\_\_\_\_ volume increases.

c) The body \_\_\_\_\_ to rid itself of waste products.

d) Red \_\_\_\_\_ take the oxygen to the working muscles.

e) Working \_\_\_\_\_ produce heat.

f) \_\_\_\_\_ widen to let more blood through.

g) The \_\_\_\_\_ increases.

h) \_\_\_\_\_, a waste product, is removed from the body and left on the surface of the skin.

i) Blood speeds up to help control the \_\_\_\_\_ to stop \_\_\_\_\_ exhaustion.

j) More \_\_\_\_\_ is required by the working muscles.

### Word bank

- temperature
- Salt
- Stroke
- sweats

- muscles
- oxygen
- heat
- heart rate

- dilate
- blood cells
- Arteries
- face



# Homework 6: Fatigue

## Student's Book pages 74-79

### Task

There are many signs that indicate a player is suffering from fatigue.

Fill in the table below for a number of fitness components. Give an example of the effects of fatigue from named sports

Component	Sport	Example of effect of fatigue on an athlete's performance
Speed		
Reaction time		
Strength		
Coordination		
Balance		
Agility		



Q1. To train anaerobically, an athlete would need to work ...

- A between 40-60% of their maximum heart rate.
- B more than 80% of their maximum heart rate.
- C less than 80% of their maximum heart rate.
- D between 60-80% of their maximum heart rate.

(Total 1 mark)

Q2. Lactic acid production occurs when an athlete's body is:

- A Digesting a large meal
- B Working aerobically
- C Working anaerobically
- D Sitting still for a long period of time

(Total 1 mark)

Q3. If fatigue occurs, it can affect performance.

(i) What is meant by fatigue?

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(2)

(ii) Give an example from a physical activity and **explain** the effect that fatigue could have on that performance.

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(2)  
(Total 4 marks)



**Q4.** Give **three** short-term effects of exercise.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

(Total 3 marks)

**Q5.** Sporting situations may be considered to be aerobic or anaerobic.

(i) What is meant by the term 'aerobic'?

\_\_\_\_\_  
\_\_\_\_\_

(1)

(ii) Describe a situation in which a performer would be working aerobically.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2)

(iii) What is meant by the term 'anaerobic'?

\_\_\_\_\_  
\_\_\_\_\_

(1)

(iv) Describe a situation in which a performer would be working anaerobically.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2)

(Total 6 marks)

**Q6.** (i) What is lactic acid?

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(ii) How does lactic acid affect performance?

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(Total 4 marks)

**Q7.** Which **one** of these is an immediate effect of exercise?

- A Improvement in muscular endurance
- B Improvement in stamina
- C Increase in aerobic fitness
- D Increase in heart rate

(Total 1 mark)

**M1.** More than 80% of their maximum heart rate. [1]

**M2.** Working anaerobically [1]

**M3.** (i) Award up to **two** marks for correctly stating what fatigue is:

- When the body, or parts of the body, get so tired/through the amount of work they have been called on to do/that they stop working properly, or sometimes altogether.

Accept the above plus any other suitable examples.

2

(ii) Award up to **two** marks for correctly giving an example of fatigue occurring in a physical activity:

- A games player being so tired near the end of a game/that their skill levels decrease and/or they are no longer able to carry on.

Accept the above plus any other suitable examples.

2

[4]

**M4.** **Three** such as:

- skin goes red/ vasodilation;
- body temperature rises/ body gets hot;
- body starts to sweat/ sweating;
- dehydration/ thirsty/ nauseous/ faint;
- breathing rate increases/ breathless/ panting;
- O<sup>2</sup> debt/ lactic acid build up;
- increased minute volume;
- increased tidal volume;
- increased gaseous exchange;
- heart beats faster/ heart rate increases;
- increased stroke volume;
- increased cardiac output;
- blood pressure rises/ increases;
- muscles tire;
- muscles ache/ pain;
- cramp / stitch

[3]

- M5.** (i) Award **one** mark for a correct definition. An equation is acceptable.  
 Aerobic – respiration in the presence of oxygen  
 Glucose + oxygen = energy + carbon dioxide + water  
 1
- (ii) Award up to **two** marks for an accurate description. For maximum marks reference should be made to the intensity and length of time of the situation.  
 e.g. activities that need long term energy systems, such as cross country running or long distance cycling  
 2
- (iii) Award **one** mark for a correct definition. An equation is acceptable.  
 Anaerobic – respiration in the absence of oxygen  
 glucose → energy + lactic acid  
 1
- (iv) Award up to **two** marks for an accurate description. For maximum marks reference should be made to the intensity and length of time of the situation.  
 Activities that need short term energy systems such as 100m sprinting or weightlifting.  
 2
- [6]**
- M6.** (i) A waste product (*1 mark*) released into the blood stream as a result of energy breakdown (breakdown of ATP) (a waste product of anaerobic respiration).  
*accept ... a chemical that builds up in muscles (1 mark).*
- (ii) It causes a reduction in the standard of performance (*1 mark*) such as:
- not as fast/ slow down;
  - not as hard/ intense;
  - not as long (time);
  - not as far (distance).
- Caused by:
- increasing the acidity in the muscle cells;
  - reducing the contraction capability of muscles;
  - causing pain;
  - causing fatigue in muscles.
- [4]**
- M7.** D  
 1
- [1]**