

**1.3/1.4 Anaerobic & Aerobic Respiration/The Effects
of Exercise**

2.1/2.2 Lever Systems/Planes & Axes of Movement

Mark Scheme

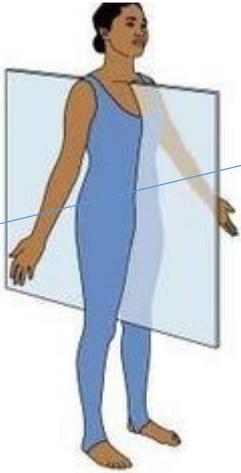
Q1. Which one of the following describes a first class lever system?

(1)

Mark One – The fulcrum is in the middle of the lever

Q2.

Figure 1 shows one plane and one axis of the human body.



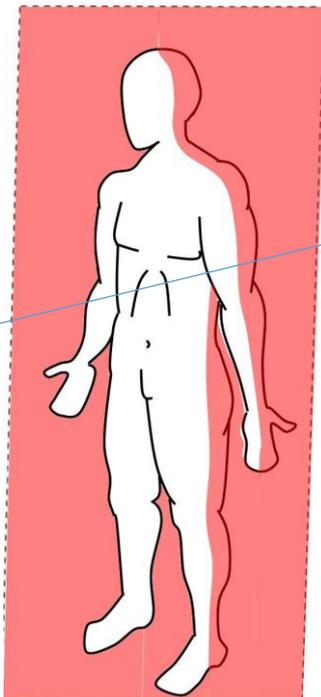
Sample exam questions:

Identify the plane and axis shown in the figure on the left (1)

Mark One – Sagittal Plane/Frontal Axis

Give an example of a sporting action used at this plane and axis? (1)

Mark One – Forward Roll/Somersault



Q3. Identify the plane and axis shown in the figure on the left (1)

Mark One – Frontal Plane/Sagittal Axis

Give an example of a sporting action used at this plane and axis? (1)

Mark One – Cartwheel

Q3.

John takes has taken part in a six week exercise programme in order to improve his cardiovascular fitness. Name two long term effects of exercise that John may have experienced and explain how they may have helped his cardiovascular system to function.

1.

Mark One – Increased Resting Stroke Volume

Mark Two – Stroke volume is the amount of blood ejected from the heart per beat.

Mark Three – This will increase at rest as the heart will be bigger and stronger – allowing more oxygenated blood to be sent from the heart each beat.

(3 marks)

2.

Mark One – Increased Capillarisation

Mark Two – This is an increase in the amount of capillaries surrounding the alveoli.

Mark Two – This allows more oxygen to diffuse from the alveoli to the capillaries and then into the blood stream, therefore creating more energy in the working muscles.

(3 marks)

Accept Other Appropriate Answers – this may include:

Decreased Resting Heart Rate

Faster recovery back to resting heart rate

Increased Maximum Cardiac Output

Increased Strength of Diaphragm/Intercostal Muscles

Increased Lung Capacity/Vital Capacity

Cardiac Hypertrophy

Q4.

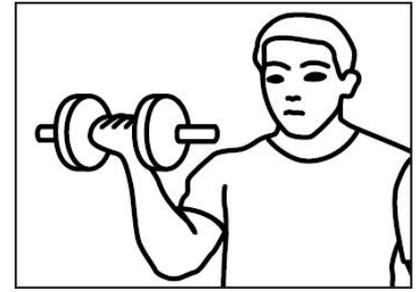
Identify the **two** by-products released while producing energy aerobically. (2)

Mark One – Carbon Dioxide

Mark Two – Water

Q6.

Figure 5 shows a man weight training.



(2)

Figure 5

Analyse how the following parts of the lever system allow the weight trainer in **Figure 5** to lift the weight.

(i) Fulcrum

Mark One – The elbow is the fulcrum.

Mark Two – Which allows the arm to bend/flex.

(ii) Effort

(2)

Mark One – The bicep is the fulcrum.

Mark Two – Which allows the weight lifter to lift the weight.

Q7.

Heart rate is measured in beats per minute (bpm).

Table 3 shows a performer's heart rate at three different times during an exercise session.

156 bpm	72 bpm	80 bpm
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Table 3

(a) Identify from **Table 3** the heart rate values recorded just before exercise starts and during recovery.

Mark One – Just before exercise = 72 bpm

Mark Two – During recovery = 80 bpm (2)

(b) Give reasons for your answers.

(2)

Mark One – Just before exercise is lowest because the body is resting and there is no need for increased blood flow.

Mark Two – During recovery is 80 bpm because the body has not fully recovered from exercise and a slight increase in blood flow is required to deliver oxygen.

Q8. Sara has worked hard to prepare for her first marathon and is considering her diet in the lead up to the event. Discuss the food sources that she should take on in the lead up and during the event. (9 marks)

A01 – In the weeks leading up to the event she should focus on taking on plenty of fats.

A02 – Fats, found in foods such as cheese and eggs, produce a slow release of energy.

A03 – This means that she will have the energy required to take part in long distance training runs without getting fatigued or burning out. Her body will also have large stores of fats ready to use as energy on the day of the race, meaning that her performance will be improved.

A01 – On the day before the event she should focus on taking on complex carbohydrates.

A02 – Complex carbohydrates, found in foods such as pasta and rice, produce energy relatively quickly. If taken on within 24 hours of her race, these can be turned to glycogen and used for energy during the race.

A03 – This will allow her to have an effective start to the race, burning off these complex carbohydrates relatively quickly at the beginning of the race before switching to her fat stores after approximately one hour.

A01 – Towards the end of the race she may need to take on simple carbohydrates.

A02 – Simple carbohydrates produce energy very quickly and may be required if she has depleted her other energy stores. She may take on ‘energy gels’ for this reason.

A03 – This will enable her to produce a fast finish at the end of the race in order to gain the fastest time possible. Following a long period of aerobic exercise the simple carbohydrates may allow a sprint finish through the use of anaerobic respiration.

Accept other appropriate answers – this may include discussion of proteins.
Pupils should also make use of a short introduction and conclusion.