

Anaerobic respiration

Mark scheme

1. (a) • appropriate scales (> halfway along each axis) 3  
 all points correctly plotted to better than ½ a square  
 lines carefully drawn  
*(allow point to point in this case) N.B. no mark available for labelling  
 axes allow either orientation for 1 mark each*
- (b) (i) ideas that 3  
 • energy transferred faster in 100m race  
*(not more energy transferred)*  
 • carbon dioxide produced faster during 1500m race  
*for 1 mark each*  
*(allow more carbon dioxide produced)*  
 correct reference to twice / half as fast in either / both cases  
*for 1 further mark*
- (ii) respiration during 100m race (mainly) anaerobic 2  
 respiration during 1500m race aerobic  
 aerobic respiration produces carbon dioxide  
 anaerobic respiration doesn't produce carbon dioxide/ produces lactic acid  
*any two for 1 mark each*
- (c) ideas that 2  
 • there is an oxygen debt / more than normal oxygen needed  
 • lactic acid needs to be oxidised / combined with oxygen  
*for 1 mark each*
- [10]**
2. (a) (before exercise) – 9 to 11 **and** (after exercise) – 12 **or** 13 1  
***both correct***
- (b) 0.75 to 0.90 2  
*ignore working or lack of working*  
*eg. 2.35 – 1.55*  
***or**  $\frac{(2.35 - 1.0) \times 60}{100}$  **or other suitable figures for 1 mark***
- (c) any **four** from: 4  
 still need to remove extra carbon dioxide  
 still need to remove heat / to cool  
 (some) anaerobic respiration (in exercise)  
 lactic acid made (in exercise)  
 oxygen needed to break down lactic acid **or** suitable reference to oxygen debt  
 lactic acid broken down to CO<sub>2</sub> and water **or** lactic acid changed into glucose
- [7]**