

# Principal Examiner Feedback

January 2012

PL Sport & Active Leisure (SL303)

Science and Technology in Sport &  
Active Leisure

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## Contents

- |                     |        |
|---------------------|--------|
| 1. Report           | page 4 |
| 2. Grade Boundaries | page 7 |

### **Unit 3: Science and Technology in Sport and Active Leisure**

#### **General comments**

Most candidates were able to respond effectively to most questions. There was evidence that most candidates had been effectively prepared, with the exception of questions 3a and 5b. Those questions aside, the majority responded positively to the tasks set, offering valid answers.

Candidates appeared to manage their time effectively and did not produce lengthy passages of irrelevant information. The vast majority of candidates appeared to complete the paper in the time available, with little evidence of rushed work towards the end.

The paper required candidates to apply their knowledge to a variety of practical situations and the higher marks, particularly in levels of response questions, were characterised by the ability to demonstrate application of theory to the stimulus material. It will be important for candidates to have practice in doing this, in their preparation for future assessments. They should also ensure that they apply it in regard to the question actually being posed. For example, when completing question 1a, many candidates were familiar with the terms used to describe types of movement, but found applying this information to the task, very difficult.

Exam technique is an aspect that requires improvement, particularly in the longer questions. There will always be a number of longer questions on this paper that have a levelled response mark scheme. This will continue in the future so candidates should be made aware how these work. At the moment most candidates of E grade and above are reaching the top of mark band 1 but higher ability candidates also appeared to find it difficult to reach mark band 3, particularly on questions 4c and 5c. Candidates must be able to use the stimulus material (if applicable) if they are to access the higher grades with ease, rather than repeat pre-learnt generic responses.

#### **Question 1(a)(i)**

The question required candidates to identify the types of joints on an individual sprinting.

#### **Question 1(a)(ii)**

The majority of candidates achieved 2 marks. It was clear from candidates' responses that they were familiar with movement terms such as flexion and extension but many were unable to use these terms to accurately describe the movements occurring.

#### **Question 1(b)(i)**

Most candidates successfully identified that Athlete B should win the race.

#### **Question 1(b)(ii)**

Many candidates successfully described that Athlete B would win because he had the greatest concentration of type 2b fibres and described why this would be an advantage during a sprint. Some candidates also identified that his lower concentration of type 1 fibres would be an advantage and why. A number of candidates also described the role of type 2a fibres.

### **Question 2(a)**

Most candidates described the positive relationship between exercise intensity and growth hormone levels.

### **Question 2(b)**

Question 2b required candidates to describe the effects of growth hormone. Some responses accurately described a range of effects in detail using appropriate scientific language, while others were only able to produce a very simple description of its effects. Weaker responses merely stated that the athlete would get bigger and stronger. Better responses described that hypertrophy would occur and that connective tissue would be stronger and bone density would increase.

### **Question 3 (a)**

Question 3 required candidates to describe how the speed of a ball was travelling would affect air flow around the ball. Many candidates merely stated that air resistance would increase, without describing how air flow around the ball would change. Candidates needed to describe how, at greater speed, the air breaks away from the surface of the ball increasing turbulence at the rear of the ball.

### **Question 3(b)**

Question 3b required candidates to outline why an understanding of drag is important. On the whole, this question was well answered. Most candidates were able to describe how drag could be decreased through the use of appropriate clothing, equipment and technique. Better responses further described how a reduction in drag would lead to improved performance through increased speed or less work needing to be performed.

### **Question 4(a)**

Question 4a required candidates to explain why a training session would be ineffective at developing aerobic endurance. Most candidates were able to explain that the training was too brief and intense and would develop anaerobic rather than aerobic endurance. However, some candidates merely stated what training the athlete should have been doing rather than explaining what was wrong with her training.

### **Question 4(b)**

Most candidates could identify an appropriate training method and explain how it could be used to improve performance. Most candidates were able to correctly explain the intensity and duration of the selected training method. Many candidates explained how prolonged low intensity continuous training could be used to develop cardiovascular fitness and how it would develop aerobic rather than anaerobic fitness. Some candidates explained the use of fartlek training. Candidates could have explained how interval training could have been tailored to develop cardiovascular fitness but none did so.

### **Question 4(c)**

Many candidates were able to describe the physiological adaptations and give a simplistic description of how they would lead to improved performance. Failure to explain how the adaptations would lead to improved performance meant some candidates were unable to move out of mark band 1. Better responses gave a detailed explanation of the physiological

changes and a clear detailed explanation of how the changes would lead to improved performance. Many candidates correctly described how oxygen supply could be improved but few described how carbon dioxide could be removed more quickly or glucose supplied more rapidly. Few candidates explained how or why these factors would allow the athlete to work harder or for longer.

#### **Question 4(d)**

Most candidates were able to outline at least one possible effect of over training. Candidates often referred to effects such as fatigue, injury and illness. Many candidates described how there is an increased risk of chronic injury and gave an example to support their answer. A significant number of candidates confused DOMS with over training. It is important that candidates are aware of the difference between DOMS and over training.

#### **Question 5(a)**

Nearly all candidates correctly identified that subjects ran faster in the new spikes than the old ones.

#### **Question 5(b)**

Responses to question 5 were poor. Many candidates described how they would display results in tables and graphs but failed to discuss how they would be analysed. Some candidates did describe the use of basic statistics such as mean or percentage increase in performance. Few candidates explained how a test of significance could be used to assess whether any improvements in performance were significant.

#### **Question 5(c)**

Question 5c required candidates to evaluate testing that had been conducted on new athletics spikes. There were a full range of responses to this question, although the number of candidates achieving the higher marks from mark band 3 was limited. Mark band 1 responses were characterized by basic identification of some of the strengths and weaknesses of testing. Some candidates incorrectly stated that the subjects being of similar age and experience was a weakness. Better responses included reference to factors such as reliability and validity and applied them to testing conducted. Mark band 3 responses were able to evaluate how the strengths and weaknesses that were identified would affect the results. For example, they were able to explain how testing outside was a weakness and how this could make the results unreliable.

#### **Question 5(d)**

Question 5(d) required students to outline the way in which technology can be used in the development of new products. Most candidates were able to positively respond to this question. Many responses focused on how technology could be used to test the effectiveness of new equipment. For example, many responses included the use of technology such as wind tunnels and video analyse to quantify the effects of new products or equipment.

## **2. Grade Boundaries**

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