



**General Certificate of Secondary Education**

**Additional Applied Science 4863**

**AASC/2F Science at Work**

**Report on the Examination**

*2009 examination – June series*

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## General comments

The majority of candidates attempted all parts of the questions. It was generally felt that the candidates were more confident this year and wrote more. Candidates who had carried out the practical procedures tested in the examination had an obvious advantage over those who had not.

### Question 1

- (a) (i) This low demand question on the use of materials was answered well.
- (a) (ii) This part was also well answered, but some candidates were still giving obscure answers for names of materials. They are advised to learn the names of common metals, polymers, natural and synthetic fibres.
- (b) (i) A reference to texture was needed, not simply to the pattern on the ball.
- (b) (ii) Some marks were lost here through poor expression, for example, friction does not make a ball bounce better, but it does give you more control of the bounce.
- (b) (iii) More able candidates had a good understanding of the importance of friction in sport and gave good answers.

### Question 2

- (a) (i) Salmonella was well known.
- (a) (ii) The symptoms of food poisoning were well known, but some marks were lost by not reading the question carefully enough, so some candidates gave causes rather than symptoms of food poisoning.
- (a) (iii) The conditions required for bacterial growth did not seem to be common knowledge and many vague answers such as 'past the sell by date', 'stored incorrectly' or 'dirty places' did not get a mark. Candidates should be warned not to use the word **heat** when referring to ideal conditions for the growth of bacteria, as many bacteria are killed by the application of heat.
- (b) (i) This question was poorly answered and it was felt that many candidates had not used the streak plate method. Candidates familiar with this technique scored full marks. Some, however, lost a mark in Stage 3 for repeating the process and it was not always clear if they were taking another sample of bacteria. Others lost a mark at Stage 2 for not being precise enough and taking some liquid rather than a sample of the bacteria.
- (b) (ii) A large number of candidates did not realise that the loop needs to be flamed between Stages 2 and three to promote good separation.
- (b) (iii) The idea of using this method to separate out the bacteria, so it is easier to identify the colonies was not well known.
- (c) The majority knew that a sterile swab would be used to take samples in a kitchen.

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**Question 3**

- (a) The majority recognised that a scar and a tattoo were unique features and would be most help in identifying a suspect.
- (b) (i) Most candidates recognised the need to label the blood, so it does not get mixed up. Some poor use of language lost candidates marks e.g. 'to know whose blood it is'.
- (b) (ii) This part was generally well answered.
- (b) (iii) The majority of candidates are now familiar with this type of question. They still need to think carefully, for example, in this case the suspect could not have been there before the crime.
- (c) (i) Solute and solvent are still being confused. Word associations might help here – **dissolve** – solvent. The formation of a suspension, if the solid does not dissolve, was not well known.
- (c) (ii) The standard test for a carbonate was also not well known.

**Question 4**

- (a) The ventilation of the lungs by the diaphragm and the muscles between the ribs was not well understood, although most managed to get one of the two points correct.
- (b) (i) There was confusion between heart rate and breathing rate and many candidates lost marks by describing how to take the pulse before and after exercise.
- (b) (ii) Reading the graph was generally well done.
- (b) (iii) There was considerable confusion as to when the student recovered.
- (c) (i) This part was generally well answered.
- (c) (ii) The majority of candidates were not familiar with a spirometer and thought that a respirometer measures the volume of air that you breathe in and out. A respirometer is used to measure the rate of exchange of oxygen and/or carbon dioxide.

**Question 5**

- (a) (i) In this standard demand question the formula for working out the percentage was not given and consequently many candidates were unable to work out the percentage. There was evidence to suggest that candidates did not have a calculator and should be reminded to bring one.
- (a) (ii) Most candidates recognised that the new Rice Crisps could be marketed as naturally lower in fat, but lost marks in their explanation by failing to give a comparison.

- (b) (i) This question required the candidates to make use of both sets of data to work out their answer and it was not obvious that some candidates had. Good answers quoted reference to the 24g being higher than the recommended 20g. Some were using the GDA column and hence lost marks by referring to high sugar content.
- (b) (ii) The danger of these foods in the diet seems to be better known, with many candidates recognising that too much salt causes high blood pressure and too much fat and sugar cause obesity. Vague references to ‘heart problems’ or ‘bad for your body’ did not score a mark.
- (b) (iii) The use of fibre in the diet was poorly understood, apart from preventing constipation. Many candidates thought fibre helps to digest the food or helps the immune system. Candidates need to understand it helps the food move through the digestive system by adding bulk to the waste and giving the muscles something to work on.

### **Question 6**

- (a) (i) More able candidates were able to use the scale and hence correctly worked out the shoe size.
- (a) (ii) Obtaining a cast of the shoeprint was generally well known, but weaker candidates were confused by the word ‘cast’. The two most common marks were pouring the mix into the mould and leaving it to set. Many mentioned plaster of Paris, but failed to mix it with water. Some cordoned off the area rather than the shoeprint.
- (a) (iii) Candidates lost marks when matching the cast of the shoeprint to the suspect’s shoe by using features that could not be obtained from the cast. The cast will just give information about the sole, not the entire shoe. Simply referring to pattern was not enough detail.
- (b) Many candidates knew the shoeprint needed to be photographed, and stored on the database but did not explain how to use it. The database would store the shoeprints of known brands of shoes, which then allows a match to be made, so you can identify the brand. Many candidates were trying to match the shoe to a suspect’s shoe on a database, which is not how they are used.

### **Mark Ranges and Award of Grades**

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