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General Certificate of Secondary Education January 2011

Applied Science (Double Award) APSC4

Using Scientific Skills for the Benefit of Society

Unit 4

Report on the Examination

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General

It was good to see that many more candidates were completing the required risk assessments for this unit.

Strand A: Monitoring Living Organism

In strand A, plans were still being awarded stage 2 and 3 marks even though vital information such as quantities was missing. At these stages, the plan must be detailed enough for another person to follow therefore plans without details of for example what fertilisers to use or the quantities to use them in would not be creditworthy.

To award 2A3, in addition to recording results, candidates must use their actual data to identify patterns and for 2A4, scientific reasoning must be used to explain the patterns. Evaluations at stage 2 were generally good with improvements suggested and justified.

Some centres did not give sufficient detail about examples of monitoring for 2A6. Most over marking occurred at stage 3 where marks had been awarded for very little evidence. 3A3 particularly is a multipart bullet point which requires data to be recorded, patterns to be discussed and shortcomings to be identified. This would include identification of anomalous results and discussion about the significance of these results on the overall conclusion.

Strand B: Making a Useful Product

In strand B, the main point that is still taking centres out of tolerance is 2B6. Candidates who copy out general notes about the factors that affect rates of reactions can only gain credit at stage 1. At stage 2, candidates must relate the factors directly to *their* reaction for example "increasing the *concentration* of *sulphuric acid* and the *surface area* of *zinc oxide* in the acid base neutralisation reaction would increase the rate of reaction". At stage 3 the discussion of collision theory must also be specific to the reaction. Occasionally incorrect calculations of yield and costs were being credited as correct. To award 3B2, in addition to a correctly balanced symbol equation (which must be written using the correct formula) must be accompanied by an explanation of the type of reaction. Candidates should apply the explanation specifically to their reaction for example "I carried out an acid base neutralisation to make a salt and water. The acid neutralises the base. "The acid was sulphuric acid, the base was zinc oxide and the salt that I made was zinc sulphate". To award 3B5, the importance of the product should be explained rather than simply describing the uses.

Strand C: Assembling an Electronic / Electrical Device

Strand C was generally marked well at stage 1 and 2. Occasionally candidates are still gaining credit for evaluating their experiment rather than the *effectiveness of the device* as required. At stage 3, many candidates were receiving credit for 3C2 for independently testing their device even though they had not suggested alternative tests. For 3C3 the evaluation must be detailed and the improvements to the device must be detailed and justified.

Strand D: Using Machines

In strand D, some centres are still forgetting to link the examples of machines to their use in a specific workplace for stage 1. Most errors occurred when awarding 2D1 and 2D2 particularly. A description of how the machine acts as a force multiplier must be described and when discussing the importance of friction, this must be related to machines rather than simple comments about the force of friction and the key words heat, energy loss and efficiency (as described in the specification) must be applied. Most candidates had carried out experiments to gain 3D1 however marks for 3D2 are still being awarded where there is no evidence from the candidate. Formulae must be given and at least one worked example of each calculation provided. Many candidates had their answers in their table of results but there was no evidence to show how this answer was arrived at.

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Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.