Examiners' Report
Principal Examiner Feedback

Summer 2017

Pearson Edexcel PLSC in Science (JSC01/01)
Year 6 Achievement Test

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Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

General comments

This was the sixth examination for the Year 6 Achievement Test in science, which again welcomed several new centres and their candidates.

It is evident that centres prepare their candidates thoroughly and carefully for this examination and the overall performance of the cohort again reflected this. Most candidates demonstrated a sound knowledge of science, many with considerable depth and breadth of knowledge and understanding. Few questions were left unanswered, showing that candidates worked hard to achieve their best.

Once again, returning centres have responded well to the feedback report from last year and acted on advice from it. Candidates' responses have become increasingly concise and factual, with good efforts by most candidates to use more scientific terminology.

Many candidates scored well on the first and second section of multiple choice questions, with the third section being more challenging. Occasionally candidates failed to cross out their first answer when they changed their choice, but it was rare to see a multiple-choice answer with no attempt made at it.

Overall, candidates performed less well on longer constructed response questions and in section B. Some candidates who score very high marks in section A do not sustain this high performance in section B.

In open response questions, candidates found the paper a little more challenging than in previous series, which examiners have taken into account when setting the grade boundaries. To perform well in the open response questions, many candidates need to become more specific in their answers. For example, whilst candidates' recognition and understanding of variables is improving, they need to become more adept at identifying the independent and dependent variables and those to control.

Candidates achieving P3 were usually able to demonstrate a consistently high standard across all parts of the paper. Those borderline candidates aspiring to P3 grades could focus further attention most effectively on the longer constructed responses, and applying generic safety features to particular investigations. In constructed response questions, candidates with more limited written English skills should focus on making short factual statements containing scientific nouns.

Comments on individual questions

Section A

Questions 1 to 8

Almost all candidates who received an award were able to answer most of the first section of multiple choice questions correctly, with many able candidates scoring full marks in this section. The most common error was in question 2, where a few candidates selected ‘disposal’ as the life process of removing waste.

Question 9

Most candidates were able to correctly link each feature of the tarsier with how it helped the tarsier, scoring both marks.

Question 10

This proved a challenging question for some candidates, who found difficulty in constructing an extended answer. However, many candidates were able to make two or three clear simple statements, linking the food to the micro-organism, to gain credit. It was evident from some responses that a number of centres had expanded on the basic content detailed in the specification, however this was not a requirement to achieve full marks.

Questions 11 - 18

Many candidates scored high marks in the second section of multiple choice questions and it was pleasing to see that they tackled a variety of styles of questions well, including the use of the key to identify specimens.

Questions 13 and 14 proved most demanding, with B being a common incorrect answer for question 14; candidates had recognised it was a sugar solution, but had difficulty discriminating between the equipment.
In question 13 candidates often gave A as an incorrect answer, showing they knew carnivores eat meat and herbivores eat plants, but were not able to apply that to the different teeth types of each group.

Question 19

Many candidates understood that the numbers of shrimp would increase, but found difficulty in expressing the reasons for that change to occur. Many candidates did gain the mark, by recognising that sticklebacks were predators of the shrimp. The most able candidates were also able to recognise the more complex interactions for the mayfly larvae. For the mayfly larvae, a large number of candidates believed the numbers would stay the same, as the sticklebacks did not feed on them, or they were on a different food chain, without recognising the common producer in both food chains and the effect this could have.

Question 20 (a)

The majority of candidates could identify the correct prediction.

Question 20 (b)

Many candidates indicated that the shape of the shadow would change, but did not clearly explain what the change would be, nor why it changed. Many mentioned an opaque shape, but did not extend that idea to state it blocked the light. The idea of light travelling in straight lines, and so was blocked, was rarely mentioned.

Question 20 (c)

Many candidates thought the light would be reflected, but did not mention that a shadow would still form on the wall. Few candidates stated it changed shape to a square, while some thought the shadow would be ‘weaker’.

Question 20 (d)

The majority of candidates scored here, with a few not including arrows or drawing them in the wrong direction. Candidates should be encouraged to use a ruler when drawing lines, ensure the lines are continuous and that they touch each part, i.e. the lamp, the book and the eye. Several candidates drew this very carefully and accurately, attempting to ensure angle of incidence equaled the angle of reflection, although this is above the requirement at this level.

Questions 21 - 29

This third section of multiple-choice questions was the most demanding, although the most able candidates showed a strong performance on them. Many candidates were confident with the circuit diagram in question 21, but were less sure of the instrument and units to measure current with in question 26. In question 23 most candidates recognised that the minerals were not required for germination, but some were not able to choose the correct one of the remaining pair.

Question 30 (a)

The majority of candidates scored, often well, on this question, with many correctly identifying the equipment and use of filter paper to separate the mixture and correctly stating what would happen to each part of the mixture. Weaker candidates used the term ‘the apparatus’ rather than using the scientific name of the parts of the apparatus, but often still identifying the process as filtration, or filtering, of the mixture.

Question 30 (b)

Again, the majority of candidates scored on this question, with most able to state that water evaporated, and that salt remains. However, fewer acknowledged that heat is required to drive this process, and only the most able correctly identified the evaporating dish as a piece of equipment.
Some candidates copied phrases from the question stem, such as ‘she would get dry salt’ which was not enough for the mark, requiring the addition of knowledge that it was left, or remains, after evaporation of the water. This practice of copying sections of the question should be discouraged as examiners give credit for the new vocabulary, ideas and concepts that the candidate brings to their response. Weaker candidates, and/or those with limited written English skills, where copying is most frequently deployed, should instead be encouraged to write the relevant nouns and verbs that they do know in simple sentences of their own.

Section B

Section B discriminated well between candidates who had transferable knowledge and skills as a result of familiarity with investigative work and those whose knowledge was limited to more basic concepts, such as fair testing. Candidates’ skills in this area have improved, and now need to adopt a little more versatility in taking general principles of variables, fair testing and safety to new situations.

Question 31

In part (a) many candidates were able to give at least one variable to keep the same, which was often the size or length of the paper, although some would repeat their answer by giving length and the width of the paper. Some candidates would mention the masses being the same, which was a correct response, others would state mass, which was the independent variable and so not able to score a mark.

In part (b) many candidates had rote learned safety answers such as wearing gloves or a lab coat. Candidates should be encouraged to think about the particular risks associated with the practical being described. Examiners aimed to cue this by emboldening words in the question stem. In this case, the masses falling off or the equipment toppling over were significant risks. Only the most able scientists assessed these specifically by suggesting that feet should be kept clear or the equipment should be kept away from the edge of the desk to prevent it falling on feet. However more radical solutions, such as the use of safety shoes, were also credited.

In part (c) most candidates correctly read the information from the bar chart to state that writing paper was the strongest paper, and whilst many gave a good explanation, a significant number had difficulty with the explanation, stating ‘it was the strongest’ or an incomplete answer of ‘it took more masses’. In such contexts, candidates should be taught to make their answer comparative, through use of ‘most’ or ‘highest number of’ masses to tear the paper. It was pleasing to note that the majority of candidates could state that she needed to repeat her investigation for (c)(ii).

Question 32

Part (a) discriminated well between candidates of differing ability, with only the most able candidates being able to give a reason here. Many candidates simply made a statement along the lines of ‘to get the average’ or ‘to know his pulse rate’.

In part (b)(i) any suitable named timing device would have scored the mark, but many candidates named other items.
Although candidates generally read from graphs well throughout the paper, parts (b)(ii) and (iii) of this question did prove more difficult for some. The most common incorrect answers for part (ii) were 4 or 6 minutes of exercise being completed. For part (iii), 8 minutes of recovery time was the most common incorrect answer seen. A few candidates were confused regarding which axis they should be reading from, giving a range of answers that related to the beats per minutes rather than the time. Many others did not note the information given on the graph regarding when exercise started and ended. Candidates could be encouraged to read all the information provided on graphs and diagrams carefully before starting to answer the questions.

Question 33

In part (a), it was pleasing to see that a large number of candidates identified the variables correctly. The remainder often identified them the wrong way around. A few stated ‘amount’ of copper sulfate instead of mass, which was not enough for the mark.

In part (b)(i) the majority of candidates could identify the anomalous result correctly.

In (b)(ii) the most able candidates drew a line to join the points on the graph to help them, or marked where they thought the result should be and read off from their mark. Others had looked across to the left of the graph until they found where the point would be correct, and read from the temperature axis, giving an answer of 52 or 53, whilst some had gone straight to the y axis and read off at 33.

Part (b)(iii) proved challenging for many candidates. Of those who did score, the most common creditworthy answer seen was an error in the water temperature, either that it had cooled too much or was too cold. A few suggested that she 'used a different volume of water'.
Others suggested she had plotted the point in the wrong place or that she had not used the right amount of copper sulfate; such answers were too vague to achieve the mark.

Summary section

Based on their performance on this paper, candidates should:

- continue to develop investigative skills, through careful application of the general principles of variables, fair testing and safety, to new situations.

- be given further opportunities to enhance their recognition of named equipment and understand why different equipment may be selected, in particular, understanding the difference between a using measuring cylinder and a beaker for measuring volume.

- continue to develop their understanding of the reasons why anomalous results may occur in any investigation and to understand why several readings are taken.

- develop a deeper understanding of inter-relationships within a food web, and so be more able to recognise cause and effect in a given food web.

- be guided on what is expected for an 'explain' question by stating what happens, then going on to state why or how it happens, using scientific terminology.

Candidates are only expected to write answers of the length indicated by the answer space provided; it should not be necessary to issue additional paper.

Candidates should write in black ink, not blue or pencil.

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