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Examiner's Report Principal Examiner Feedback

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PLSC Science

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6 (JSC11/01)

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General comments

Overall, candidates made a great effort with this paper, working hard to demonstrate their level of scientific achievement and attempting to answer most questions, showing their determination to do well. Candidates seemed to have sufficient time to answer the questions, and presented work neatly, trying to keep to the answer in the space provided. The graph and other parts requiring lines to be drawn were generally completed using a ruler which improves neatness and accuracy.

Clearly, centres and teachers had prepared candidates carefully for this exam. Candidates generally showed a good understanding of scientific terminology needed to be able to access some of the more challenging questions, and to provide complete answers to them.

Most candidates were able to effectively answer multiple-choice, short answer questions and those requiring a longer answer. Some candidates still need to be encouraged to read questions carefully, particularly the lower achieving students, and to provide a little more detail in questions worth 2 marks.

Candidates achieving P3 demonstrated their ability across the specification, as well as in Section B. They provided detailed answers for questions of 2 marks and could link ideas. They were also able to draw conclusions, and this capability has begun to develop in those of P2 standard. Those borderline candidates aspiring to P3 could focus on ensuring their understanding of fair testing, reliability and accuracy in investigations.

Comments on individual questions

Section A

Multiple choice questions are marked by computer, so it is not possible to comment on how candidates achieved on these.

Question 11

(a) Many candidates were able to give one or two valid points, although some did not fully explain themselves, as they may have stated 'the roots supports the plant' or 'the roots hold the plant up' which is the function of the stem. Some simply stated 'water' and 'nutrients' without saying what the roots did with them.

(b) Most candidates were able to correctly label the three parts. A few candidates mixed up the male and female parts, or named the stigma as the style or, on occasions, the ovary. Some P1 candidates could not name the petal correctly.

Question 19

Approximately half the candidates were able to explain why salt and sugar could not be separated by this method. The most common error were candidates who only named one solute which would pass through the filter paper, rather than stating that they would both pass through. By stating 'salt will dissolve and pass through' does not explain what happened to the sugar, so could imply that the sugar did not dissolve or did not pass through the filter paper. A few candidates mentioned different solutes, such as flour.

Question 20

(a) The majority of candidates were able to achieve 1 mark here, with P3's sometimes scoring the second mark. Candidates often did not draw a correct symbol for the buzzer, sometimes inverting them, or drawing them not connected to the circuit. Other errors included drawing a line through all components, or not adding the lines for the cell to the ends of the wire, leaving a large gap between the lines for the wires and the cell. Some candidates forgot to include the cell, but had other components correct.

(b) Many P3 and some P2 candidates answered this well, clearly stating the role of each part. P1 candidates often gave the function of only 1 part of the system, often the plastic cover to prevent electric shocks from occurring. Some candidates gave a generalized answer such as 'to prevent shock from the electricity' without mentioning either part.

Question 21

(a) Many candidates were able to answer this by correctly identifying evaporation and condensation. More candidates could identify evaporation in the correct part of the system. The most common error was labelling precipitation as condensation.

(b) This question was more difficult for candidates to answer, with a few higher achieving candidates able to answer correctly. Incorrect answers would include 'the sun' or 'clouds'. Candidates answering 'the sun' understood that the sun starts the process with evaporation, but did not fully understand that the water vapour cools as it rises, and so condenses to form clouds which are visible.

Question 26

(a) Many candidates found this more challenging. Candidates would recognize the heart as part of the circulatory system, but would often include lungs, kidneys or thorax rather than blood vessels and blood. A few circled more than the three asked for.

(b) Few candidates scored full marks here, with the P3's able to explain fully why the pulse rate increases, understanding that the pulse rate increase was due to the heartbeat increasing, and understanding why that happens when we exercise. Weaker candidates mentioned breathing rate increasing, or that the body needed more energy rather than requiring more oxygen (for

respiration to release the energy) which would be transported faster with an increase in heartbeat.

Question 27

(a) Again, many candidates answered this correctly. A few candidates gave Y or X, some named another force, and a few tried to give a written explanation.

(b) P1's again found this difficult, and they may have scored better if they had read the question carefully to understand what was being asked of them. Errors included candidates giving a letter instead of naming a force or stating gravity again.

(c) P1 and many P2 candidates could not name the units, sometimes giving the name of an instrument (often a ruler) or stating cm.

Question 28

Candidates scored better on this type of question than previously, developing an understanding that this type of question needs answering with 'As x increases / decreases then y stays the same, increases / decreases (or that there is no pattern). Many of the P3 and some P2 candidates were able to score full marks. The most common errors were being too vague, e.g. 'as the temperature changes the volume is more' (1 mark as they have not indicated what makes the greater volume of dough), 'when there is more heat there is more dough' (1 mark as they have recognized that increased heat causes a change, but there is not more dough, it just has a greater volume) or 'do it again to see if they get the same results' (0 marks as they have misunderstood the question).

Question 29

The most common error was naming the mixture (of salt and water) as the solvent rather than a solution, but other candidates appeared to guess both.

Question 30

Some able candidates did not read the question carefully and attempted to name the planets they thought each was in order, rather than using the letters given. Some candidates looked only at the numbers in the table and gave the letters for the numbers in order from smallest to largest. Candidates did need to

look carefully at the table and did require the knowledge of how many days are in a year to complete this correctly.

Section B

In section B candidates demonstrated their knowledge and skills they have developed in undertaking practical scientific studies and applied some of the scientific principles of fair testing and reliability to new situations, or to practicals they may have undertaken in the classroom. This is always an area for continued development as candidates find it difficult to apply their practical skills to new, novel situations.

Question 31

(a) Some candidates would simply state 'sunlight' or 'temperature' rather than adding that these factors were kept the same. Some also stated they should set up another two sets of pots, which would improve reliability rather than making it a fair test.

(b) Candidates found this a harder question to answer, with many stating 'to make it a fair test' or 'to make sure it is accurate'.

(c) (i) Most candidates who achieved a grade were able to correctly identify the result that did not fit with the rest of them.

(ii) Candidates found this a more challenging question, as some stated that they forgot the decimal point or added an extra zero, both of which are errors in recording, rather than an error in measuring the height.

(d) While many candidates answered this correctly, many still find difficulty in reading a scale, giving an answer of 25 or 21.

(e) Many candidates answered this correctly, with incorrect answers being evenly split between the other options.

Question 32

(a) Few candidates scored both marks here, with D, evaporating dish, being the one most often incorrect. Some candidates identified C as a stopwatch, which would not be required in this investigation.

(b) Some candidates gave a list of several items of safety equipment. Candidates should be encouraged to think of the most important one that applies to the investigation being asked about. As some types of gloves can make touching a hot object worse, we were looking for safety gloves or mitts.

Question 33

(a) (i) Some candidates restated 'volume of air in cm^3 ' for the second column of the table. Although some repeated the units in the body of the table this was not penalized, but candidates could be discouraged to do this.

(ii) Some candidates did not understand how to order the results so that it was easier to draw a graph from the results.

(b) (i) The most common error was candidates not attempting to plot the point. Few of those who did plot the point placed it in an incorrect position.

(ii) The majority drew an acceptable line. A few had gone over the line several times, meaning it was not possible to read a single point from a single line, so was not considered acceptable. A small number drew bars for each point rather than a single line through the points.

(iii) Approximately half the candidates gave the correct answer of 32 cm, with the most common error being '30 cm', so some of the weaker candidates need to look at scales a little more closely to understand how to read them.

Summary section

Based on their performance on this paper, students should:

- aim to undertake a variety of practical work on a regular basis, taking care to choose appropriate safety equipment for that particular investigation of experiment
- continue to develop their understanding of the terms fair test, accuracy and reliability and be able to apply these to different investigations
- develop their skills in being able to accurately read scales from a variety of pieces of equipment, including points between two major scale lines
- practice drawing a conclusion from data sets provided to them, including noting when there is no pattern in results
- develop their understanding of the terms 'solute', 'solvent' and 'solution'
- develop their understanding of the circulatory system further
- P1 standard candidates could be encouraged to read a question carefully so they understand how they need to answer a question.