



# Examiners' Report

Summer 2014

PLSC Science (JSC01/01)  
Year 6 Achievement Test

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Publications Code PL039772

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## **General comments**

This was the third examination for the Year 6 Achievement Test in science to which we welcomed many additional new centres and their candidates. Overall, candidates were once again well prepared and many had a very sound knowledge of science at this level. Examiners were particularly encouraged to see that many returning centres had acted on feedback in reports from previous examination series.

Many candidates attained, or came close to full marks on the first two multiple-choice sections of the paper and high scores were also seen in the third, more challenging set of multiple-choice questions.

In open response questions, many candidates demonstrated their proficiency in recall of scientific terms and understanding of scientific principles. Although the quality of answers in section B is improving year on year this is still an area where some candidates' overall performance could be raised further.

Candidates achieving P3 were able to demonstrate a high standard in all parts of the paper and the overall performance of the cohort once again reflected thorough preparation by both candidates and centres.

## **Comments on individual questions**

### **Questions 1 to 10**

Almost all candidates who received an award were able to answer most of the first section of multiple-choice questions correctly, with the many able candidates scoring full marks in this section. When mistakes were made, the most common incorrect response was to question 8, where predator and prey were confused.

### **Question 11(a)**

Many candidates were familiar with this equipment and were able to label filter paper and funnel correctly, thus scoring both marks. Some candidates, whose attempts indicated that they were familiar with the equipment but not secure on the naming, scored one mark by labelling filter and funnel in the two spaces. A few chose 'paper' and 'filter' as their responses, or made reference to a sieve as one of the labels. A few candidates seemed unfamiliar with the equipment and gave responses that suggested they were labelling the contents of the funnel, often by copying nouns from the introductory sentence.

### **Question 11(b)**

The most able candidates gave very clear descriptions here and recognised that the salt had dissolved. However a surprising number of candidates, who had shown familiarity with filtration in part (a), went on to say in part (b) that the salt stayed in the filter paper. Less able candidates sometimes gave contradictory answers suggesting that they were not sure where the salt would be.

### **Question 12(a)**

Candidates' knowledge of micro-organisms is improving year on year. Although the most common correct answers were the use of yeast in bread making or the use of bacteria in yoghurt making, named processes such as insulin production were also seen. Less able candidates used decay as their example, but as this was in the question stem it was only credited as a useful function if qualified with, for example, compost making, recycling of nutrients or decay of dead animals, leaves etc.

### **Question 12 (b)**

Most candidates answered this well by giving answers that usually included movement and reproduction plus one other life process, often growth. Candidates should be discouraged from using 'breathing' as a life process as a substitute for respiration, even at this level. Weaker candidates gave answers that only applied to animals, or just to humans e.g. sleep and/or talk. A useful mnemonic is MRS GREN, representing: movement, respiration, sensitivity/response to stimuli, growth, reproduction, excretion and nutrition.

### **Question 13**

Many candidates just listed three electrical appliances in the picture, often as a single noun, one per line. Those who answered the question with a short, simple phrase such as 'the radio is near water' tended to score well, usually listing two or three distinct hazards.

### **Question 14**

Many candidates, regardless of performance elsewhere on the paper, gave voltmeter rather than ammeter as their answer here. Candidates who scored close to maximum marks on the paper regularly failed to score this mark, as was the case last year too. Some candidates wrote variations of 'electric meter' or 'meter' unqualified.

### **Questions 15 to 23**

Many candidates scored high marks in the second section of multiple-choice questions, with the most able candidates often scoring full marks. Mistakes tended to occur most frequently on question 19, where C was the usual incorrect choice and/or question 20, where B was often selected.

### Question 24

Performance on this question varied by centre. Some candidates seemed much more familiar with the typical features, such as those listed in the specification, that might be used to identify a flowering plant. Good answers made reference to the shape of the leaves, the colour of the flower or the number of petals. Less able candidates, which included both those who seemed unfamiliar with this and those who had difficulty in expressing their observations, made statements relating specifically to the picture such as 'there are five flowers' or 'it is a nice flower' or 'it is tall'.

### Question 25

The majority of candidates scored one mark here. The middle (darkest) ray was usually correctly paired with the bottom (darkest) seabed. However the other two rays were often paired incorrectly. Some candidates matched all three incorrectly by pairing the spotted ray with the darkest background and so on.

### Question 26

This question was often very well answered, with the most able candidates scoring all four marks. Of those candidates not scoring full marks, many could identify a solution and a high proportion realised that Solid B did not dissolve, although some thought that B had not been tested. Many candidates were able to express the idea that more of C dissolved than D, or that C was more soluble. Candidates should be taught to use comparative terms in their responses (such as 'more' in this instance) when prompted in the question stem to make a comparison rather than making two separate observations such as 'a lot of C dissolves but only a little of D dissolves'. Evaporation was commonly identified as a way of getting solid A back, but a number of candidates described heating the liquid without indicating that it would need to be evaporated. Candidates should be encouraged to include specific scientific terms in their answers, particularly in the Chemistry topics where the correct use of a key term such as evaporation/solution/ dissolves is often creditworthy.

### Questions 27 to 32

This third section of multiple-choice questions was more demanding, although the most able candidates again gave very strong performances, often scoring close to full marks. Although the less able candidates showed no particular pattern of error, there was more consistency to the incorrect choices made by those scoring between half and full marks on this section. For example, adaptation was frequently chosen instead of variation (question 28) and an example of an emulsion (question 30) was not well known. The change in size of a shadow (question 32) was often given as smaller; although about 50% of candidates answered this correctly there was still much evidence of thinking and answer checking since many correct answers were accompanied by earlier crossed out answers. Irreversible changes (question 32) were generally well understood with most candidates making a correct selection here.

### Question 33

Almost all candidates were able to name the thermometer and state the temperature shown. Many also could state the effect of refrigerating a thermometer, although there was a tendency among less able candidates just to state (incorrectly) that the temperature would become 0°C rather than indicating a decrease. Candidates were not expected to know/quote the actual temperature of a refrigerator.

### Question 34

The vast majority of candidates correctly identified D as the best equipment for measuring this volume. Explaining why was found considerably more difficult, with many candidates touching on the right answer but not quite being clear enough to gain the mark. Some repeated the question stem by saying that D was the most accurate equipment.

### Question 35

This question discriminated well between candidates whose knowledge of scientific enquiry was formulaic and those who had a more versatile understanding of investigative procedures.

#### Question 35(a)

All but the least able candidates were able to score one mark here, often two. Some could identify that the same amount of water was necessary but then sometimes gave 'type of paper towel' as their second suggestion or even just answered 'paper towel'.

#### Question 35(b)

Although some candidates realised that a measuring cylinder was necessary, the most popular answer here was 'beaker' despite an earlier cue in question 34.

#### Question 35(c)

Fewer candidates than expected were familiar with the term reliable or the reason for repeating results. Many stated that the test should be repeated to make it fair.

#### Question 35(d)

More able candidates showed a clear understanding of Abdul's decision to ignore one of the results. Others often realised that 14 was the highest number, or could see that it stood out in some way, but did not relate this just to results for paper towel C, instead making the comparison across the whole table or down the 3rd test column. Others selected 14 but then went on to point out that the average was wrong, often with evidence of calculations in the space below.

### Question 35(e)

The majority of candidates scored one mark here for drawing bars A and B on the bar chart. Fewer than 50% of candidates realised that the axes needed labelling. When they did, the labels tended to be either x and y, or just one or other label was added.

### Question 35(f)

Very few candidates realised that the answer was towel B, but when they did, their explanation was nearly always accurate. This resulted in candidates who had a clear understanding of the investigation scoring two marks, where the majority scored zero. However those candidates who did score two marks here were not always those who had done well in section A. The vast majority of candidates incorrectly chose towel C as the answer, supporting this with an explanation that pointed out that bar C was the highest.

### Summary

Based on their performance on this paper, candidates should:

- continue to develop their understanding of investigative skills such as looking for patterns and trends in results and reasons why results are repeated or sometimes ignored;
- secure their knowledge of the names/uses of basic pieces of equipment such as measuring cylinder, ammeter and beaker;
- be given further opportunities to construct and interpret bar charts, or other representations of data, with accuracy;
- be guided on how best to attempt answers they are unsure about by using key scientific vocabulary e.g. evaporating and avoiding just a single noun as an answer e.g. kettle, toaster, yeast;
- be discouraged from copying out sections of the question to form their answer, as indicated in previous reports.

Some candidates or whole centres are using pencil or blue ink despite clear instructions on the front cover of the paper to use black ink or black ball-point pen. As this qualification will be moving to scanning and online marking, future candidates should adhere to these instructions.

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. In case where it was used this year it was often as a result of the

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