



**General Certificate of Education (A-level)  
June 2012**

**Science in Society**

**SCIS3**

**(Specification 2400)**

**Unit 3: Exploring key scientific issues**

***Report on the Examination***

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## General Comments

Candidates were able to understand the quite complex data presented and to apply How Science Works ideas to answering the questions. This year the structure of the paper was changed slightly to include only 5 questions in section A, with two questions covering the three brain topics. This seems to have worked well.

However, there were several ways in which candidates could improve their exam technique. They need to think more carefully about what the question is actually asking. Several questions in this paper ask, in different ways, for description or interpretation of data. This means that marks will be awarded for conclusions drawn from the data and, most importantly, for evidence to back these conclusions up quoted from the data in the question.

In many questions a section towards the end asks candidates to integrate information from the whole question and use it to justify an opinion on the issue. This integration leading to an evidence-based opinion is not always well done. Bland generalisations, unrelated to the data, gain few marks.

## Question 1

There were weaknesses in understanding and recall of science explanations in this question. Some candidates seemed to be relying on GCSE level science knowledge rather than the specific science taught as part of this course. For example in (a) they discussed simple genetic determinism and suggested that schizophrenia was entirely caused by genes. In (b) they wrote about gene expression in terms of dominant and recessive. The interplay of genes and environment is an important part of topic 3.3.2.

- (c) This was a demanding section that required candidates to integrate all the information given in section (b) of the question. Many made one or two relevant points but failed to relate the two sets of data to explain that they did suggest a mechanism for the influence of maternal care, but only in rats. Weaker candidates did not always realise that care is the independent variable in Fig. 2 and Fig. 3.

## Question 2

- (a) Many candidates did not know which part of the diagram represented the cortex.
- (b) Marks were awarded for a discussion of the evidence, not for a yes or no answer. Most candidates described the data well, although few mentioned the small sample size.
- (e) Candidates did not always take advantage of 6 marks and the instruction 'Discuss' to demonstrate a wider knowledge of the issues represented by these two statements. They confined themselves to rewriting each statement in their own words when, from this and the AS course, they might have been expected to know a little more about drug policy issues and the success or otherwise of fundamental research in treating disease. There was too much emphasis on side effects and risk, ignoring the fact that for either approach drugs still have to be tested.

Some seemed to have understood the term 'theory' in Statement 1 to mean unreliable.

### Question 3

- (a)(i) Many answers seemed to indicate that candidates had gleaned what they could from the information in the question rather than drawing on their HSW knowledge of modelling. They failed to mention the key fact that a computer model is based on current understanding of physical inter-relationships, represented by equations, between key variables in a complex system.
- (a)(ii) This questions asked why models are useful in climate research. Most gave answers based on the need for political action, which were accepted, but it does again underline the poor understanding of modelling and its role in modern science.
- (a)(iii) This proved too hard for most candidates. They perhaps need more practice understanding probability.
- (b)(i) The conclusion from Figure 7 is fairly obvious but to get full marks candidates also needed to cite the data as evidence.
- (b)(ii) The instruction ‘Explain’ meant that candidates were expected to provide a mechanism, in terms of radiation, for the link between sea temperature and greenhouse gases.
- (b)(iii) Almost all candidates correctly identified headline B as the most accurate. Better candidates saw that the claims of causation were unsupported by the research which only identified a correlation. Some used evidence from Figure 7 to support their answers effectively. Unfortunately some candidates got enmeshed in writing about supposed doubt as to the link between greenhouse gases and global warming/climate change. Whilst this opinion might be worth describing in some contexts, it is not a valid point here. In discussing headline C some candidates wasted time explaining that not all greenhouse gases are human emissions.

### Question 4

- (a)(iii) There were many sensible answers. However, candidates should be warned against simply repeating the question in their own words, such as “electricity usage is going to stay the same”. They also need to make sure that they have given two distinct points, not the same point twice in different words. Some talked about more efficient ways of generating electricity, which would affect primary energy demand but does not answer this question.
- (b)(i) A small question but it did reveal that some candidates do not know much about nuclear power. “You need to burn a substance to create the electricity to heat up nuclear rods” and “need to give energy to neutrons” are examples of the misconceptions.
- (b)(ii) The question specifically instructed candidates ‘using data in Figure 9’. Other general answers were not credited in this case, but were applicable to part (iii).
- (b)(iii) Candidates must beware of giving answers that simply repeat information in the question. The introduction to part (b) told them that the overall policy is to maintain supplies whilst reducing carbon dioxide emissions. These points are not an answer to the question of why CCS was chosen to meet these policy objectives.

- (e) This question required candidates to integrate the information in Figures 8 and 9. Few made enough points to get four marks, although there is plenty to say both from the data, and from their own knowledge of the advantages and disadvantages of different technologies.

### **Question 5**

- (b)(i) The question asked ‘Why is a log scale used?’ Most candidates seemed to be answering the question ‘Why plot a graph?’. Log scales are mentioned in the specification in 3.5.1.
- (c) The question asked ‘Based on the evidence in this question...’. Few candidates integrated the information to provide support for a reasoned answer. They wrote generalisations unsupported by any evidence at all, from the question or their own knowledge.

### **Question 6**

A very high proportion of candidates seem to have only considered ethics in connection with animal testing, hardly a ‘new technology’ but we did allow it. There were some very good, well-structured answers on topics which included cloning, end of life decisions and genetic screening. The best answers usually focused quite narrowly on a single application. ‘Use of embryonic stem cells’ gave better answers than trying to cover ethical issues raised by all possible uses of stem cells and cloning. Some candidates chose a technology which they did not really understand. ‘Designer babies’ clearly interests students as a topic but most do not know what can and can’t in fact be done.

Too many answers contained a useful list of dilemmas raised by the chosen technology, but unfortunately did not go on to discuss the ethical principles that might then assist decision making.

Candidates may well choose to discuss ethical principles derived from the values inherent in a religion. However, comments such as “We should not play God” or “It goes against what God intended” do not come into this category and do not gain marks.

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

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