
LEVEL 3 CERTIFICATE AND EXTENDED CERTIFICATE **APPLIED SCIENCE**

ASC3: Science in the Modern World
Report on the Examination

1775 (1776 & 1777)
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General

Students were able to attempt most of the questions in the paper. The mathematical calculations (questions **02.1**, **10.2** and **12.4**) had the highest number of non-attempts and generally students found them difficult. Students need to be familiar with basic mathematical calculations, such as percentages, during the preparation for the ASC3 examination.

Students also found questions based on scientists (questions **03.3**, **06.2** and **07.1**) difficult. Students were unable to apply their knowledge of the roles of scientists to the contexts in the question paper. In addition, they were unable to specify exactly what the scientists would do, such as 'test', 'monitor' or 'develop', and instead used vague terms such as 'look at' and 'find out'.

There were a very large number of students who required additional pages to complete the question paper. In most cases, students need to be more succinct in their responses.

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Question 1

01.1 This was a good introductory question which was well answered. 57% of students achieved both marks. Those who didn't achieve both marks tended to describe the explosion.

01.2 45% of students achieved no marks here because they:

- described newspapers rather than Source A
- or stated that the source was written by the World Nuclear Organisation rather than explaining why this made the source more valid.

Question 2

- 02.1** 79% of students were unable to correctly calculate the percentage increase in the size of the exclusion zone. 7% of students did not attempt this question.
- 02.2** 56% of students were able to identify that people were protected by the extension of the exclusion zone because there was less risk of exposure to radiation. Those students who did not achieve the mark mostly stated that it moved people further away but did not explain why this protected them.
- 02.3** 70% of students achieved the mark for stating that the radiation had dropped. Most quoted directly from the source – ‘radiation levels dropped rapidly’. Those who did not achieve the mark mostly incorrectly stated that this drop was down to 50% rather than that levels had fallen to less than 50% above normal levels.

Question 3

- 03.1** 34% of students achieved the mark for stating that toxicologists might monitor the effects of radiation on either living organisms or the environment, or for monitoring the level of radiation in living organisms.
- 03.2** 55% of students correctly stated that there was a lack of public health data before 1986. Those who did not achieve the mark generally did not include ‘before 1986’ or ‘before the accident’ or made a comment such as ‘we don’t yet know the effects of the radiation’.
- 03.3** 39% of students achieved this mark for identifying that a comparison was made between the exposed group and a control (or non-exposed) group. Incorrect answers were mostly related to screening or field missions lifted from the source.

Question 4

- 04.1** 24% of students were able to give correct answers about why the source may not be valid. Stating that it was written by a newspaper or giving the name of the newspaper was not sufficient.
- 04.2** Many students had overlooked the word 'still' and simply described how radiation can pass into food chains. Higher-attaining students were able to discuss the long half-life of caesium-137 causing the radiation to remain in the environment for over 30 years.
- 04.3** Most students appreciated that residents should avoid eating contaminated food, but a good range of other answers, relating to resettling and increasing funding, were also seen.

Question 5

- 05.1** 51% of students achieved the mark for identifying children or teenagers as the target audience for this source. The most common incorrect answer was 'the general public'.
- 05.2** 35% of students gave good answers about the type of language used in the source and examples of the language. A further 50% achieved one mark for an incomplete answer which, mostly, gave an example quoted from the source but did not describe the language.
- 05.3** 12% of students were able to identify that a lack of peer review or lack of referencing might make the source less valid.

Question 6

- 06.1** This was well-answered, with 78% achieving the mark for 'no humans'. Incorrect answers tended to refer to animals adapting to the radiation.
- 06.2** This question about the role of a scientist (in this case a biologist) was not answered well. Students mostly lifted direct text from the source about placing cameras to track animal activity. 20% of students gave a creditworthy response.

Question 7

- 07.1** Some students were able to state that testing materials was the main role of a material scientist. Many students used other verbs which did not describe the role as well as 'testing'. This included 'finding out' and 'looking at'. Very few students got the idea of developing new materials.
- 07.2** 11% of students were able to identify and explain two improvements of the new steel shelter. Some students didn't read the question carefully and gave 'more durable' which was the example included in the question.

Question 8

Students struggled with this question, which was similar to that of questions asked on both previous papers. 16% of students achieved no marks on this question, with 18% achieving all three marks.

Question 9

There was a full spread of marks seen across the mark range. Many students wrote more than necessary and ran over onto additional pages. As in previous series, the amount written did not relate to the final mark achieved. There were some excellent concise answers seen which achieved the full nine marks (3% of students) and were written entirely in the space provided on the question paper. Students are advised to be more concise in making their points as many had clearly spent too long on this question and may have limited the opportunities to achieve marks elsewhere on the paper.

4% of students did not receive any marks as they generally had not read the question properly. Instead of discussing groups of people, exposure and consequences, these students had written about validity and how effective the sources were.

Some students (approximately 45%) achieved limited marks because they had written generally about 'people' and had not specified named groups of people, such as workers, firemen or residents. Students are advised to read these extended response questions very carefully to ensure that they are fully addressing the question in their response.

Question 10

- 10.1** 11% of students could give two correct reasons why nuclear power is becoming more popular. 43% of students achieved one mark, mostly for stating that fossil fuels are running out.

Some students missed out on marks for answers such as nuclear power being more environmentally friendly or 'greener' because they didn't specifically mention less greenhouse gases or less carbon dioxide.

- 10.2** 59% of students achieved at least one mark in this calculation for correctly adding up the total number of reactors including the new ones. 22% of students were able to go on from this to correctly calculate the percentage of total energy generated.

Question 11

- 11.1** 87% of students achieved one mark for either making a comment about comparison or for a comment about clear presentation. 13% of students were able to describe the two comparisons between sources and years well.

- 11.2** This question was well-answered by most students. Those who did not achieve all three marks (28% of students) tended to say 'water' or just 'hydro' instead of the acceptable answers of 'hydroelectric', 'tidal' or 'wave'. Most students correctly named solar power and wind turbines.

- 11.3** Most students could correctly interpret the graph to see that more gas, nuclear or other fuels had been used in 2016 compared to 2015. 31% of students achieved no marks for this question. Most of these students discussed 'poor weather' but did not specifically talk about 'less sunshine' or 'less wind'.

Question 12

- 12.1** 55% of students correctly identified France as the country which relied more on nuclear power in 2016. Incorrect answers were mostly USA.
- 12.2** 72% of students achieved this mark. Students who had given France as the answer to question **12.1** but then said 'nuclear is 73% of its total energy' did not get this mark because they had not stated that this was more than any other country. Many of those who had incorrectly given USA as the answer to question **12.1** still achieved the mark here for using data in the table to explain why the USA was chosen.
- 12.3** 28% of students achieved all three marks for their comparison of the USA and China. Marks could only be achieved if data from the table was used in the comparison.

Unacceptable answers might be 'USA has more reactors' or 'USA has 99 reactors and China has 36'. Correct answers for one mark might be 'USA has more reactors as it has 99 compared to China's 36' or 'USA has 63 more reactors than China' or 'USA has almost 3 times as many reactors as China'.

- 12.4** This mathematical calculation was challenging to most students with 14% students achieving full marks. The 17% of students who achieved one mark generally failed to get the second mark because they did not give their answer to the nearest billion.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.
[UMS conversion calculator](#)