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

ASC3: Science in the Modern World  
Report on the Examination

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1775 (1776 & 1777)  
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## General

There was clear evidence that schools/colleges had prepared their students well using the pre-release material in the weeks leading up to the exam. Most students were able to attempt the majority of the questions on the paper. The higher attaining students could express themselves well and demonstrated an excellent understanding of the information provided in the pre-release material.

## Question 1

- 1.1 This question required two examples of microplastics other than microbeads, such as microfibres and abrasive sandblasting. Many students did not read the stem of the question properly and gave microbeads or microbead products such as cosmetics/toothpaste as one or both of their answers. Although synthetic clothing or synthetic fibres were acceptable answers, sportswear or clothing alone were not creditworthy.
- 1.2 Some students were able to give the idea of avoiding using microbeads because there are alternatives or the idea of public concern about microbeads.
- 1.3 Almost all students were able to score at least one mark. This was mostly for the idea that microbeads can pass through water filtration systems. Higher attaining students were able to give four good reasons. All answers on the mark scheme were seen in students' responses.
- 1.4 Students who implied great distances with responses such as 'around the globe' or 'across the world' were given credit. An answer such as 'plastic in the ocean is in constant motion', which could be lifted directly from Source B, was not creditworthy as it did not actually answer the question about why microplastic pollution is a global problem.

## Question 2

- 2.1 The evidence provided in Source A to demonstrate the potential health risk to humans was that microplastics have been found in shellfish. 'Seafood such as mussels' was an acceptable response, but seafood alone was not enough.
- 2.2 Many acceptable variations on the correct answer of 'Chinese people might eat more fish' were seen such as 'fish is their national diet'. An answer suggesting that oceans or seas around China might contain more plastic pollution or more microbeads was allowed but a suggestion that plastic waste from other countries is sent to China was not creditworthy as it did not refer to plastic in the ocean.
- 2.3 Most students who achieved the mark here had written 'nanoplastics can pass across the gut' as this was a direct lift from the text. 'May pass through the gut' was not the correct answer as this implied it passed through and out of the gut unchanged, unless the student had added 'and into the blood'.

### Question 3

This mathematical question was a good discriminator. Lower attaining students were able to select one or more of the relevant figures from the source, while higher attaining students were able to perform the calculation and round their answer correctly. 16% of students achieved all four marks, with nearly 80% achieving at least one mark.

### Question 4

- 4.1 Almost all students were able to give the correct response about consumers making an informed choice.
- 4.2 80% of students were able to give the correct response about labelling products with microbeads affecting sales of products. Those students who gave an incorrect response tended to refer to the costs involved in changing labels.

### Question 5

- 5.1 Approximately half of students were able to lift the correct statistical evidence of 0.01–4.1% from the source. Some students lifted this incorrectly with answers such as 0.1 instead of 0.01 or 0.41 instead of 4.1.
- 5.2 Almost all students achieved at least one mark here, mostly for the idea of recycling more plastic. Some of the lower attaining students wrote about the ban on microbeads, demonstrating that they had not properly read the question. 11% of students were able to give four good measures for reducing microplastic pollution.

### Question 6

Almost all students achieved at least one mark here, mostly for stating that Dr Ugelstad invented microbeads. 50% of students could also relate this to the later consequence of the environmental damage. Overall, only 16% of students were able to discuss the initial success of microbeads in medical treatments.

### Question 7

- 7.1 70% of students were able to give the idea that the public perception of microbeads is that they are bad (mostly written as 'inherently bad' as this was lifted from the source). 24% of students were also able to explain how this might slow down development of medical microbead products.

- 7.2 There was good discrimination on this question, with 14% of students achieving both marks and almost half of students achieving one mark.

Some of those who did not achieve any marks had misunderstood the question. As a result they were discussing Dr Friedman's article, Source D, as the one that had not been peer-reviewed, rather than the article he was referring to.

- 7.3 Half of the students achieved one mark for saying 'improve the technology'. Nearly 20% of students also achieved the second mark for explaining that this improved technology could enable the microbeads to stick together and be filtered. 'Increased aggregation to prevent filtration failure' was allowed for the second mark (although this was a lift from the text and would have been better written in the students' own words).

## Question 8

This extended answer question was generally well answered with a good spread of marks across all 3 levels of the mark scheme. Where students wrote extensively but didn't score well it was generally because they talked about what the sources were about rather than their validity, effectiveness or language used for the target audience.

Some students wrote about the fact that the sources were 'adapted', for example 'Source A – adapted article from Education in Chemistry'. They went on to say that therefore these articles may not be true or valid. Schools/colleges should note that it is a requirement of the copyright permission that the articles used in the pre-release materials are described as 'adapted' by AQA. This does not mean that they have been altered by anyone else prior to their use by AQA. Usually this 'adapted' refers to a few minor omissions to reduce the length of text so as not to confuse students. It would be useful if schools/colleges could ensure that students are clear about what these 'adapted' statements mean in future series.

A few students discussed the 'no open web permission'. Once again, this was a requirement of the copyright permissions. Some students did make some very relevant comments about this meaning the audience being limited to subscribers such as chemistry teachers (which was a very creditworthy answer). But others discussed it as a means of nobody else being able to alter it (therefore being more reliable) which was irrelevant as other articles cannot be altered by just anyone either.

## Question 9

- 9.1 38% of students scored three of the four marks here but missed the mark for saying that more money was spent on household waste management. Only the highest attaining students (5%) tended to get this fourth mark.

74% of students achieved two marks, mostly for describing the increase in money spent on household waste management and for quoting correct data from the table. Some students attempted to quote data but missed off the fact that the figures were in millions of pounds.

- 9.2 Only 37% of students got this calculation correct. 10% of students didn't attempt this question. Students should be familiar with simple mathematical calculations such as percentages, percentage increase etc.
- 9.3 This calculation was only correctly performed by 23% of students, although 62% of students achieved one mark for selecting the correct data from the table. Some students lost the second mark for incorrect rounding of the answer. 18% of students didn't attempt this question (the highest percentage on the whole paper).

## Question 10

- 10.1 Most students achieved both marks for this question with almost every student achieving one mark. This was one of the easiest questions on the paper.
- 10.2 This question was one of the hardest on the paper and was a good discriminator. Less than 1% of students achieved all four marks, with 58% achieving at least one mark. Students were given credit for saying 'more steel used in packaging than aluminium' for the equivalent of the first marking point on the mark scheme.
- 10.3 Over 80% of students achieved one mark for correctly interpreting the data in the table.

## Question 11

Despite the scientists in this question being listed in the specification, students struggled to apply what they knew about the roles of these scientists to the scenario used in the question (working for the Environment Agency to monitor waste from industry in rivers).

Only 10% of students were able to correctly describe the role of all three scientists. 67% of students achieved one mark (mostly for ecologist). The scientist whom most students did not achieve a mark for was the analytical chemist. Answers such as 'analyse chemicals' were not creditworthy unless students had added 'in the waste' or 'in the river sample'.

### 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](#)