2021 Assessment resources
GCSE Statistics

SEC and Data - Common

Answers and commentaries

The question numbers in this resource reflect the question numbers from the original papers and match the question numbers in the corresponding 2021 assessment materials.

Question 9(a)
No example available

Commentary
The ideas of being able to get instant responses or explain questions in an interview are expected.

Question 9(b)
No example available

Commentary
Appropriate answers are likely to discuss the time or cost of carrying out surveys in this way.

Question 9(c)
No example available

Commentary
The problem with the question is that it is a leading one / offers an opinion within the wording.

Question 1
Please see the mark scheme

Question 10(a)

10 Here are some variables.

Some are relevant to people and their main job and some are not.

A – How much you are paid in a year
B – Your favourite TV series
C – How many days of holiday you are allowed each year
D – How tall you are
E – Distance from your home to work
F – How much you like your work colleagues
G – How happy you are at work

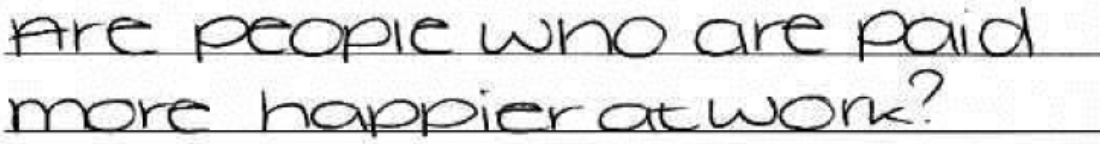
Adam is investigating whether people who are paid more are happier at work.

10 (a) Write down a possible research question for Adam's investigation.

[1 mark]

Student A

10 (a) Write down a possible research question for Adam's investigation.



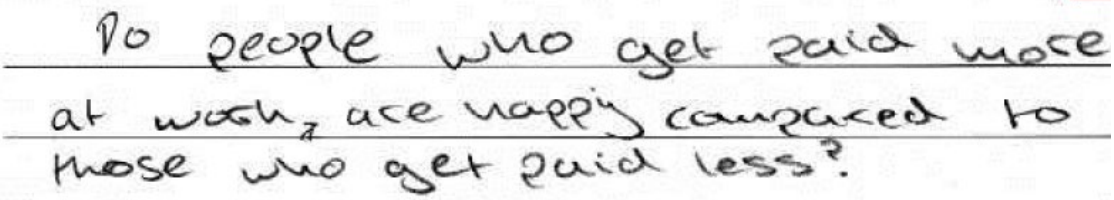
Commentary

A good response, clearly citing both variables and asked as a research question, not a hypothesis.
1 mark

Student B

10 (a) Write down a possible research question for Adam's investigation.

[1

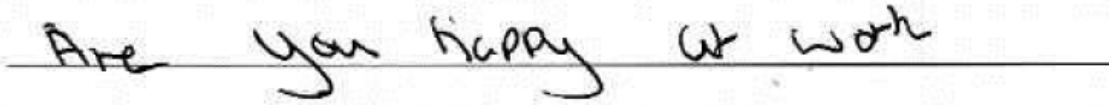


Commentary

Not as clearly stated but acceptable at this level as a possible research question.
1 mark

Student C

10 (a) Write down a possible research question for Adam's investigation.



Commentary

Response does not include any reference to the amount of pay, so is not acceptable.
0 marks

Question 10(b)

Please see the mark scheme.

Question 10(c)

Please see the mark scheme.

Question 10(d)

Please see the mark scheme.

Question 9(a)

9 A hotel chain has 800 hotels.

Of these hotels 200 have a car park.

Rogan wants to choose a sample of the hotel managers, stratified by whether they run a hotel with a car park or not.

Rogan wants a total sample size of 60

9 (a) How many managers who run a hotel with a car park should be in the sample?

[2 marks]

Answer _____

Student A

9 (a) How many managers who run a hotel with a car park should be in the sample?

[2 marks]

$800 \div 200 = \frac{1}{4} = 4$

$60 \div 4 = 15$

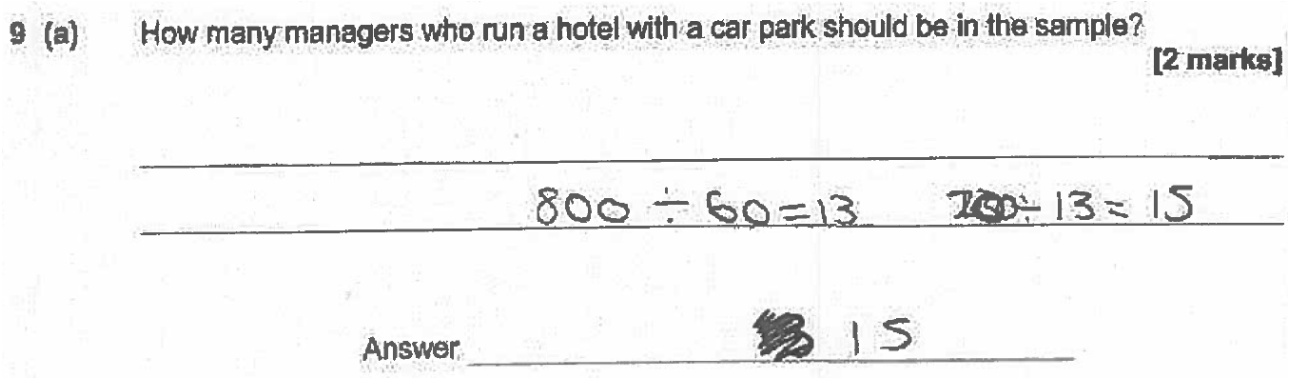
Answer 15

Commentary

Though the fraction ¼ appears to be somewhat dubious on line 1, the issue is quickly recovered to give a fully correct response.

2 marks

Student B


9 (a) How many managers who run a hotel with a car park should be in the sample?

[2 marks]

800 ÷ 60 = 13 13 ≈ 15

Answer 15

Commentary

Note this alternative method, the decimal on the 13 has clearly been carried through the calculation even though it is not shown to achieve the correct answer.

2 marks

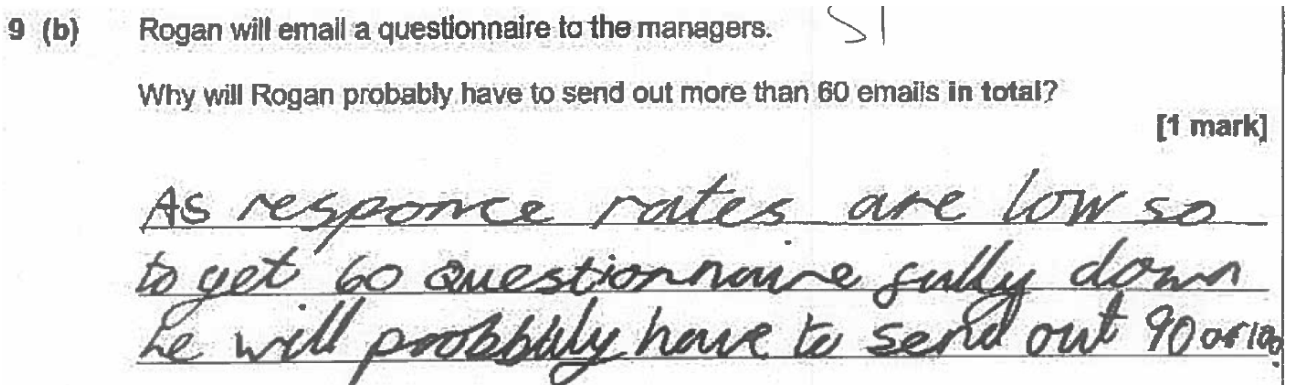
Question 9(b)

9 (b) Rogan will email a questionnaire to the managers.

Why will Rogan probably have to send out more than 60 emails **in total**?

[1 mark]

Student A


9 (b) Rogan will email a questionnaire to the managers. 51

Why will Rogan probably have to send out more than 60 emails in total?

[1 mark]

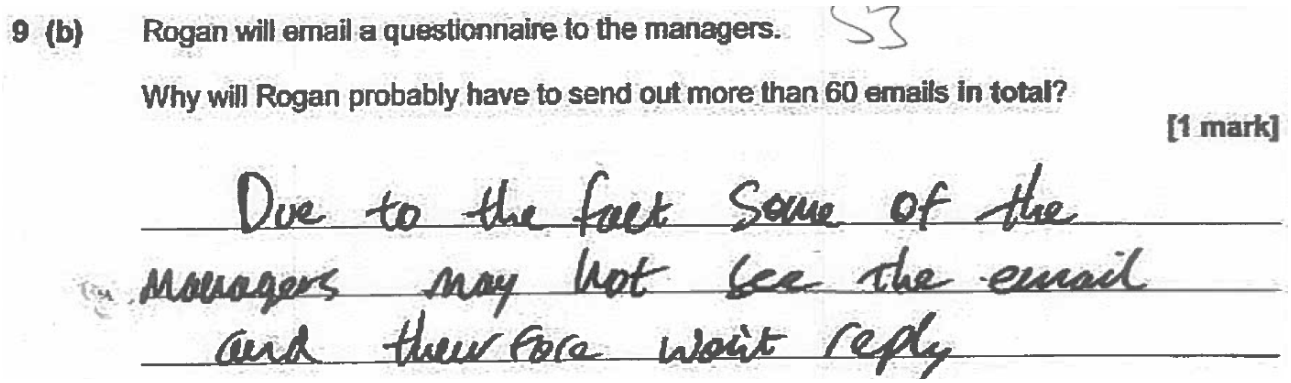
As responce rates are low so to get 60 questionnaire fully done he will probably have to send out 90 or 100

Commentary

The estimate of the number required is not important, but the key possible issue of low response rates is covered in this response.

1 mark

Student B



9 (b) Rogan will email a questionnaire to the managers. 53

Why will Rogan probably have to send out more than 60 emails in total?

[1 mark]

Due to the fact some of the managers may not see the email and therefore won't reply

Commentary

Successfully references low response rate in a different way.

1 mark

Question 15(a)

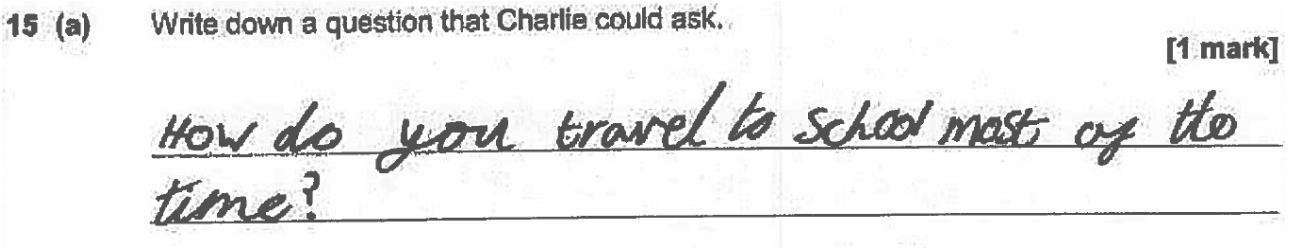
15 Charlie wants to investigate how people do most of their travelling.

She begins by asking 30 of her friends how they travel to school.

15 (a) Write down a question that Charlie could ask.

[1 mark]

Student A



15 (a) Write down a question that Charlie could ask.

[1 mark]

How do you travel to school most of the time?

Commentary

A typical correct response.

1 mark

Student B

15 (a) Write down a question that Charlie could ask. [1 mark]

what is your most often form of transport to school?

Commentary

Different wording but appropriate answer.
1 mark

Student C

15 (a) Write down a question that Charlie could ask. [1 mark]

How do most of you complete an average distance of travel?

Commentary

Does not have the required reference to school.
0 marks

Question 15(b)

15 (b) The frequency table shows Charlie's results.

Method of Travel	Frequency
Car	3
Bus	6
Walk	18
Cycle	2
Train	1

Charlie says,

> "10% of these friends come to school by car, so 10% of all students come to school by car."

Comment on **both parts** of Charlie's statement.

[2 marks]

"10% of these friends come to school by car"

"10% of all students come to school by car"

Student A

Comment on **both parts** of Charlie's statement.

[2 marks]

"10% of these friends come to school by car" This statement it true and has been supported with evidence for 30 friends.

"10% of all students come to school by car" This isn't accurate as well as reliable as she is saying her friends results reflect the whole school which is only a very small sample.

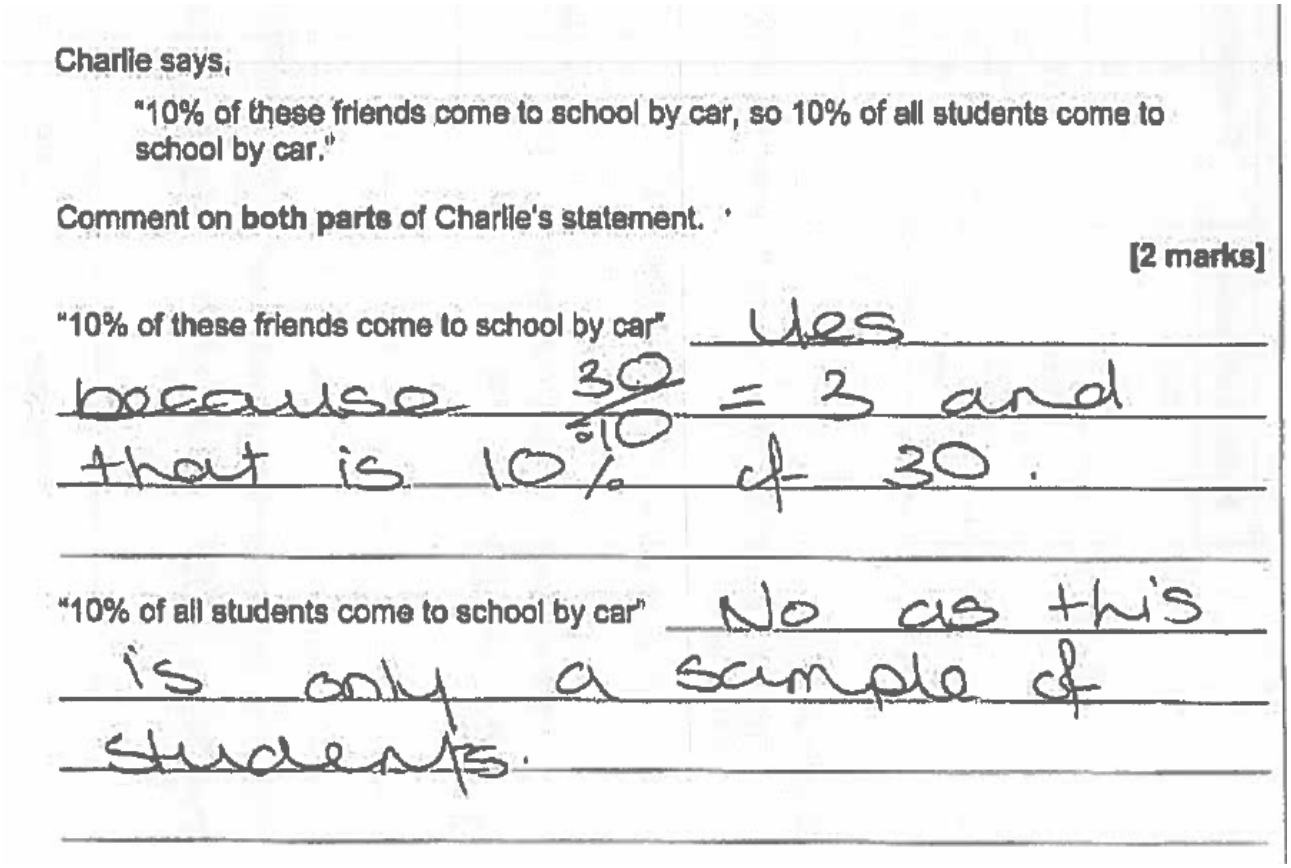
Commentary

The first part of the answer does not explain what the evidence is and how it supports the statement being true.

The second part of the answer is accepted as implying that we don't really know whether the sample is going to be representative of the whole school.

1 mark

Student B



Charlie says,

"10% of these friends come to school by car, so 10% of all students come to school by car."

Comment on **both parts** of Charlie's statement.

[2 marks]

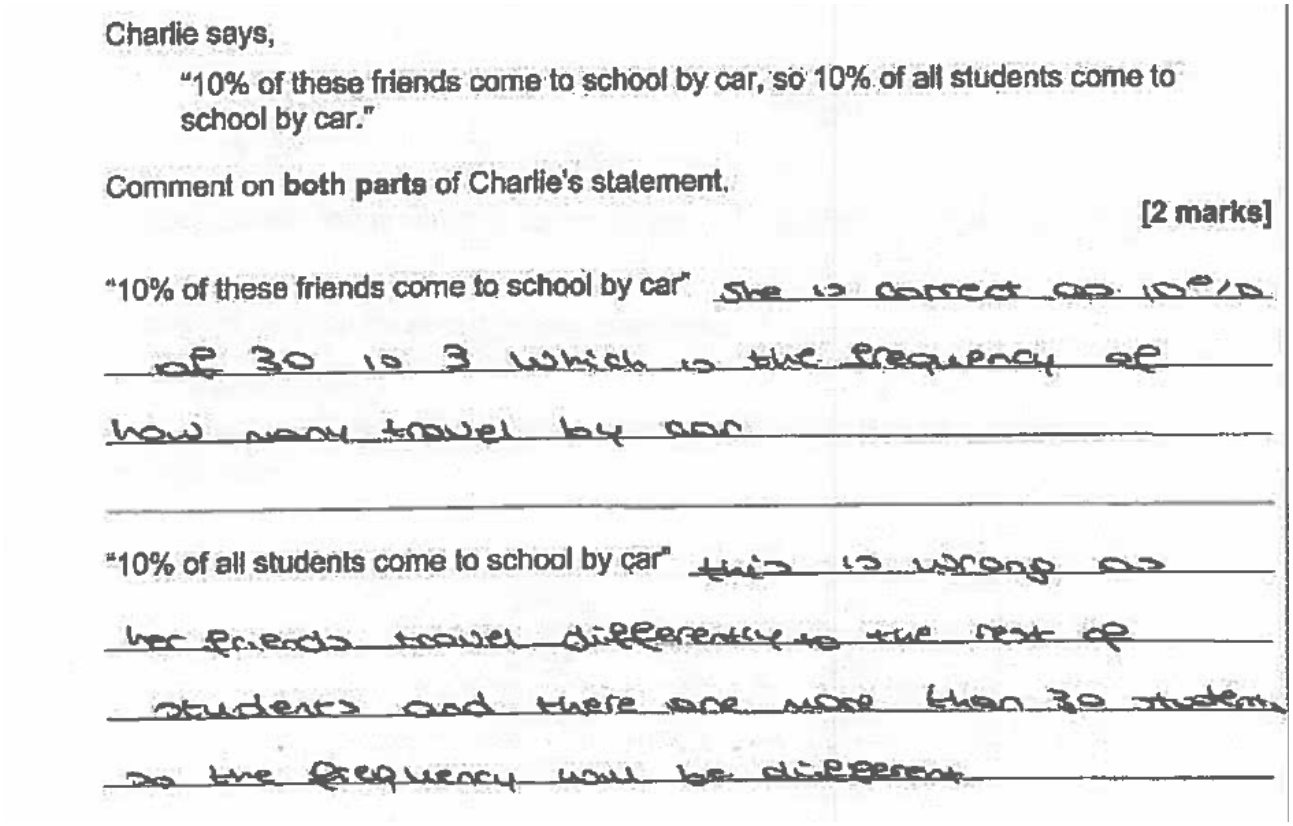
"10% of these friends come to school by car" Yes because $30 \div 10 = 3$ and that is 10% of 30.

"10% of all students come to school by car" No as this is only a sample of students.

Commentary

The first part of the answer is a good and clear explanation of the supporting evidence.
The second part of the answer is just sufficient due to the word 'only' .
2 marks

Student C



Charlie says,

"10% of these friends come to school by car, so 10% of all students come to school by car."

Comment on **both parts** of Charlie's statement.

[2 marks]

"10% of these friends come to school by car" she is correct as 10% of 30 is 3 which is the frequency of how many travel by car

"10% of all students come to school by car" this is wrong as her friends travel differently to the rest of students and there are more than 30 students so the frequency will be different

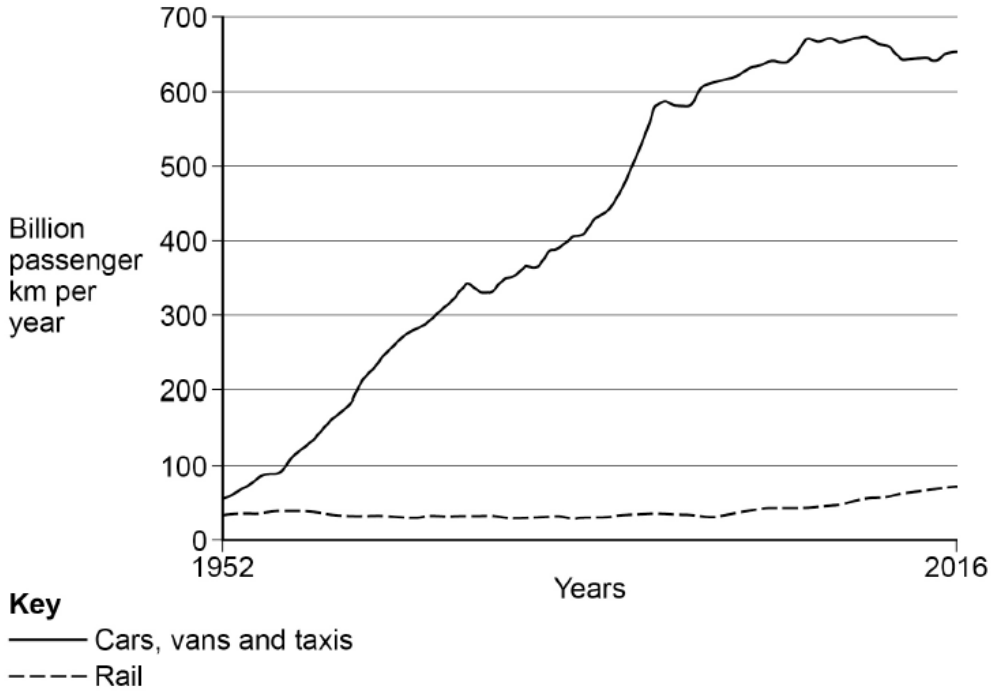
Commentary

Both parts of the student response show acceptable work for the marks.
2 marks

Question 15(c)(i)

15 (c) Charlie hears on the news that more people than ever are using cars to travel and roads are getting busier.

She sees this graph on a news website.



Source: adapted from Department for Transport

Comment, with a reason, whether or not the graph confirms that,

15 (c) (i) more people are using their cars to travel.

[1 mark]

Student A

15 (c) (i) more people are using their cars to travel.

[1 mark]

Yes, AS The number of ~~vehicles~~ passengers have increased dramatically ~~where as train have only increased slightly~~

Commentary

This appears to be a mis-interpretation of the vertical axis on the graph so is not awarded the mark.

0 marks

Student B

15 (c) (i) more people are using their cars to travel.

[1 mark]

The car line is going up.

Commentary

A basic but just acceptable response.

1 mark

Student C

15 (c) (i) more people are using their cars to travel.

[1 mark]

the graph does not confirm an increase in car use specifically but of cars, vans and taxis

Commentary

As can often be the case in questions like this, it is possible to get credit for supporting appropriately either a yes or a no answer. This response is correct in highlighting the graph is about several types of transport in one line and not just cars.

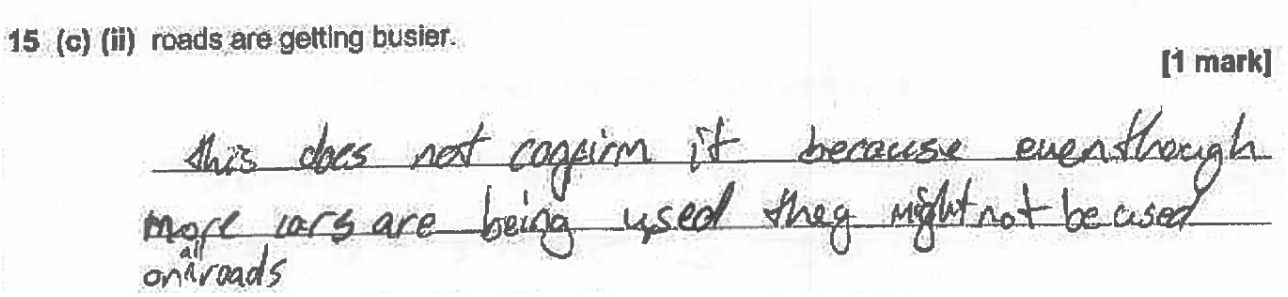
1 mark

Question 15(c)(ii)

15 (c) (ii) roads are getting busier.

[1 mark]

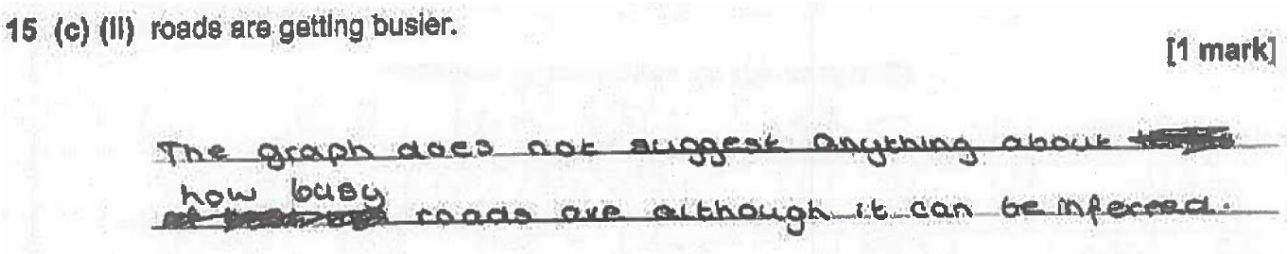
Student A



Commentary

Does not have the clarity required – seems to be confused between car use and roads.
0 marks

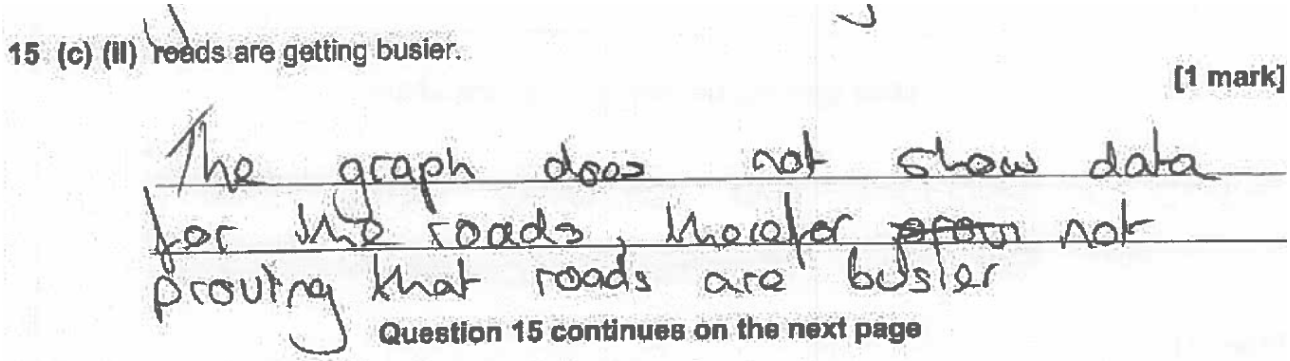
Student B



Commentary

Borderline suitable response, doesn't completely explain why but confirms inference rather than definitive information.
1 mark

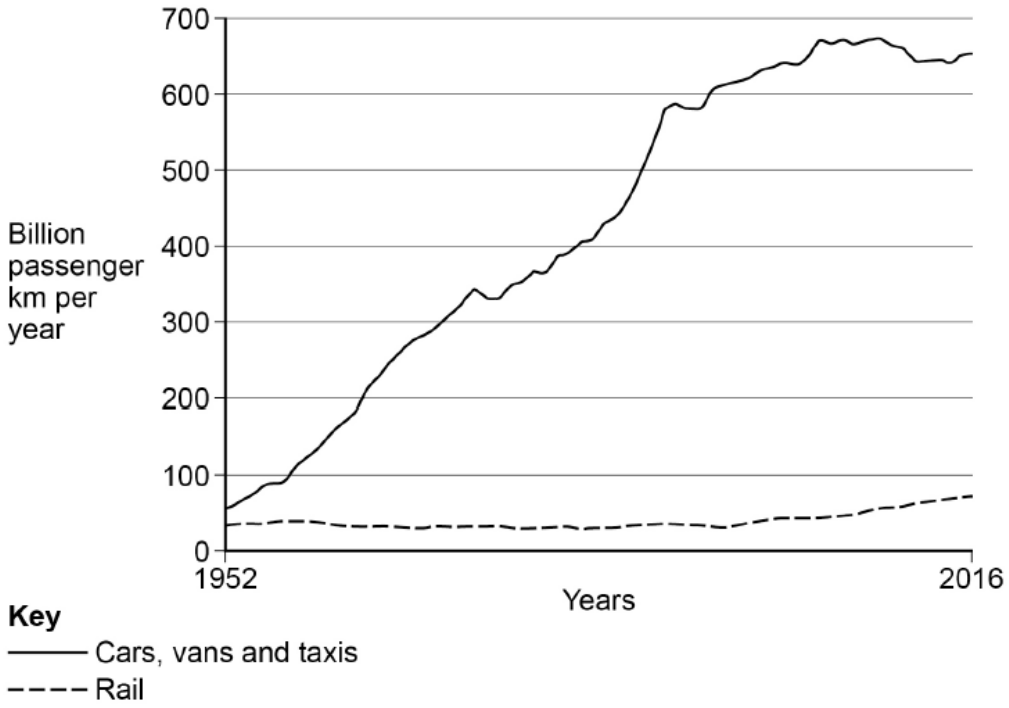
Student C



Commentary

A correct response, citing that there is no information about roads at all on the graph.
1 mark

Question 15(d)



15 (d) Using the graph on page 23, make **two** statements about **rail** travel over the years.

[2 marks]

Student A

15 (d) Using the graph on page 23, make **two** statements about **rail** travel over the years.

[2 marks]

1) rail travel hasn't increased very much compared to cars and vans.
2) rail travel has only started to increase the last couple of years before 2016.

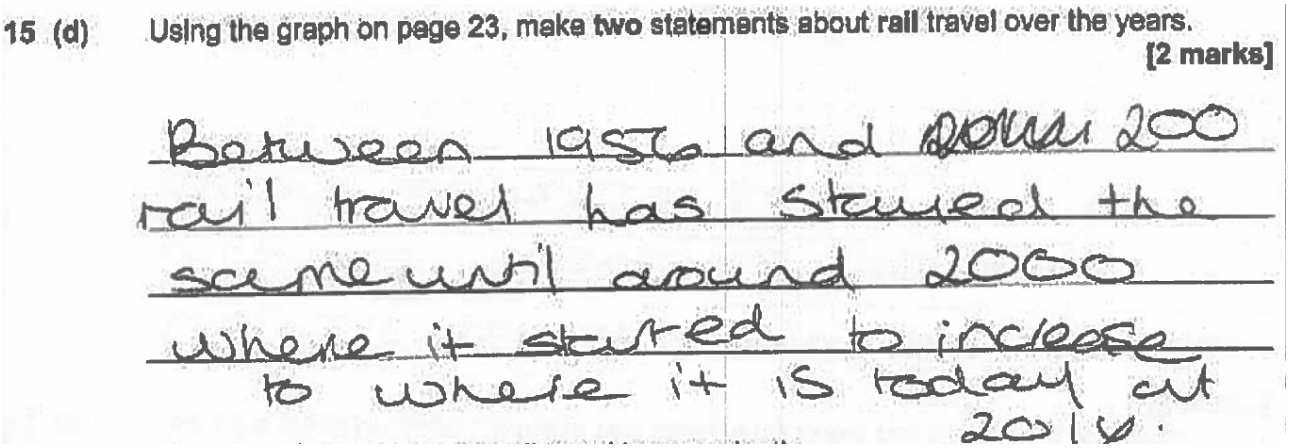
Commentary

A well-structured and clear response giving two correct statements about the rail travel. Often we would give answer lines split into statement 1 and statement 2 but if we don't, this is a good way of answering the question.

2 marks

Student B

15 (d) Using the graph on page 23, make **two** statements about **rail** travel over the years. **[2 marks]**



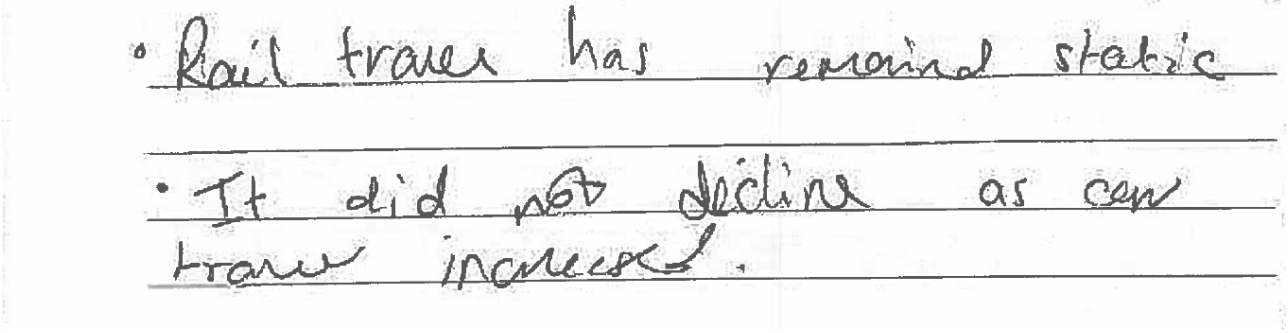
Commentary

Two different but correct statements about how rail travel has changed across the years shown by the graph.

2 marks

Student C

15 (d) Using the graph on page 23, make **two** statements about **rail** travel over the years. **[2 marks]**



Commentary

A little too vague (and similar) to score both marks but either statement can be judged to be worth one mark.

1 mark

Question 15(e)(i)

15 (e) Charlie decides to look into rail travel in more depth.

She asks 12 of her friends how many times they have been on a train in the last year.

The results, in ascending order, are

0 0 0 0 0 1 1 2 4 6 7 387

Charlie says,

"The average number of times my friends have been on a train in the last year is 34"

15 (e) (i) Which measure of average did Charlie work out?

Show working to support your answer.

[2 marks]

Answer _____

Student A

15 (e) (i) Which measure of average did Charlie work out?

Show working to support your answer.

[2 marks]

mean ~~as his~~ $\frac{0+0+0+0+0+1+1+2+4+6+7+387}{12}$

$= 34$

Answer mean

Commentary

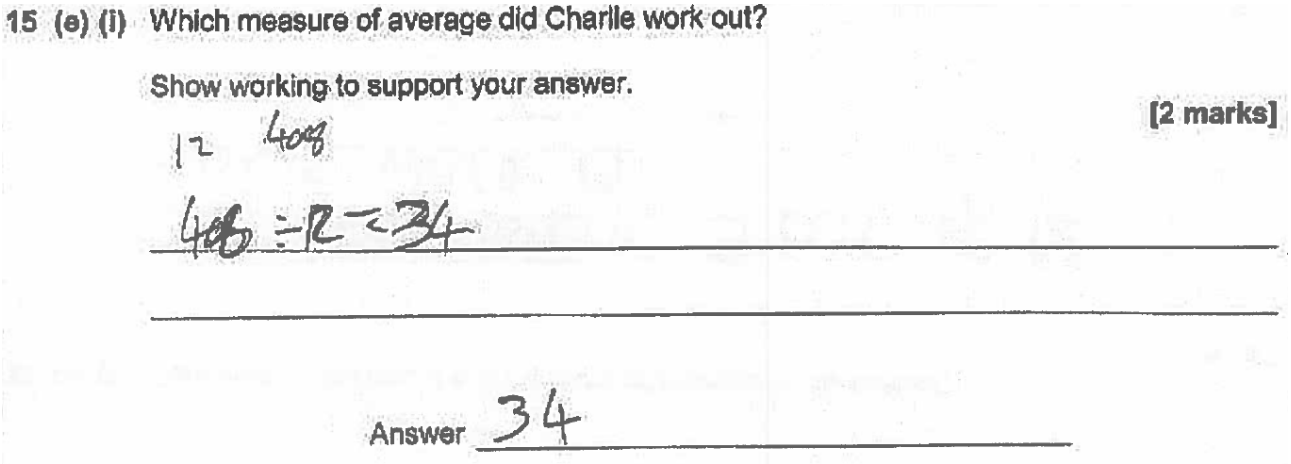
Correct choice of 'mean' and justification by showing the calculation which will have been used.
2 marks

Student B

15 (e) (i) Which measure of average did Charlie work out?

Show working to support your answer.

[2 marks]



Commentary

Correct calculation (benefit of doubt on 406 / 408) but the student has not named the type of average at all.

1 mark

Question 15(e)(ii)

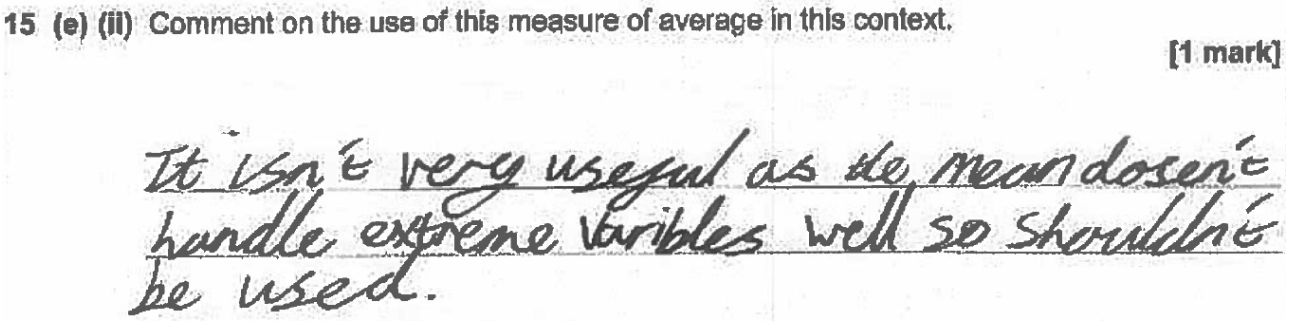
15 (e) (ii) Comment on the use of this measure of average in this context.

[1 mark]

Student A

15 (e) (ii) Comment on the use of this measure of average in this context.

[1 mark]



Commentary

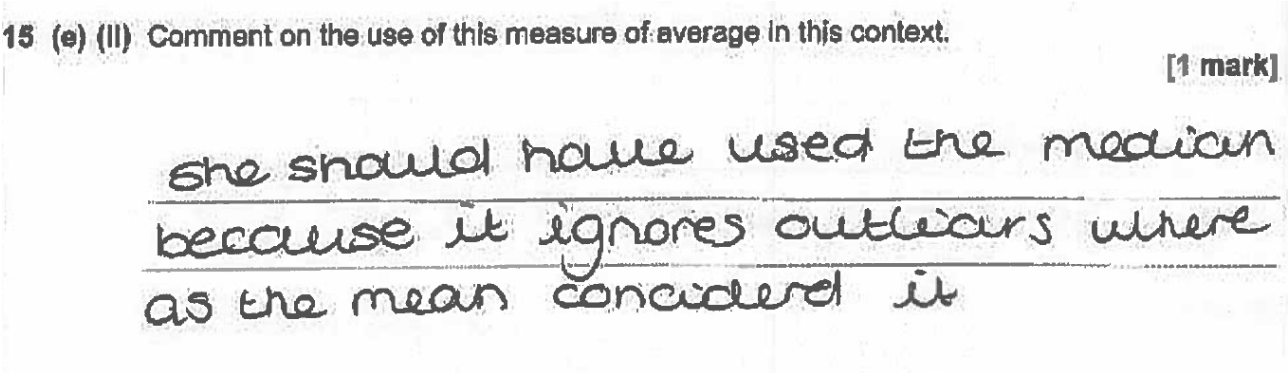
A good response, we can interpret their words 'handle extreme values' to imply they understand the issue.

1 mark

Student B

15 (e) (ii) Comment on the use of this measure of average in this context.

[1 mark]



Commentary

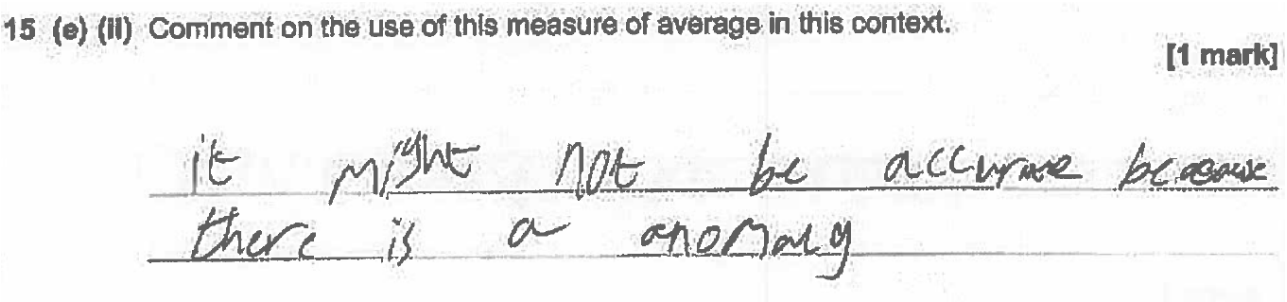
Excellent response which goes further than we asked for.

1 mark

Student C

15 (e) (ii) Comment on the use of this measure of average in this context.

[1 mark]



Commentary

Unfortunately the accuracy is not the issue, it is the appropriateness so this cannot be awarded the mark.

0 marks

Question 15(e)(iii)

15 (e) (iii) Discuss the suitability of **two** other measures of average Charlie could use.

Suggest which would be the best measure of average to use.

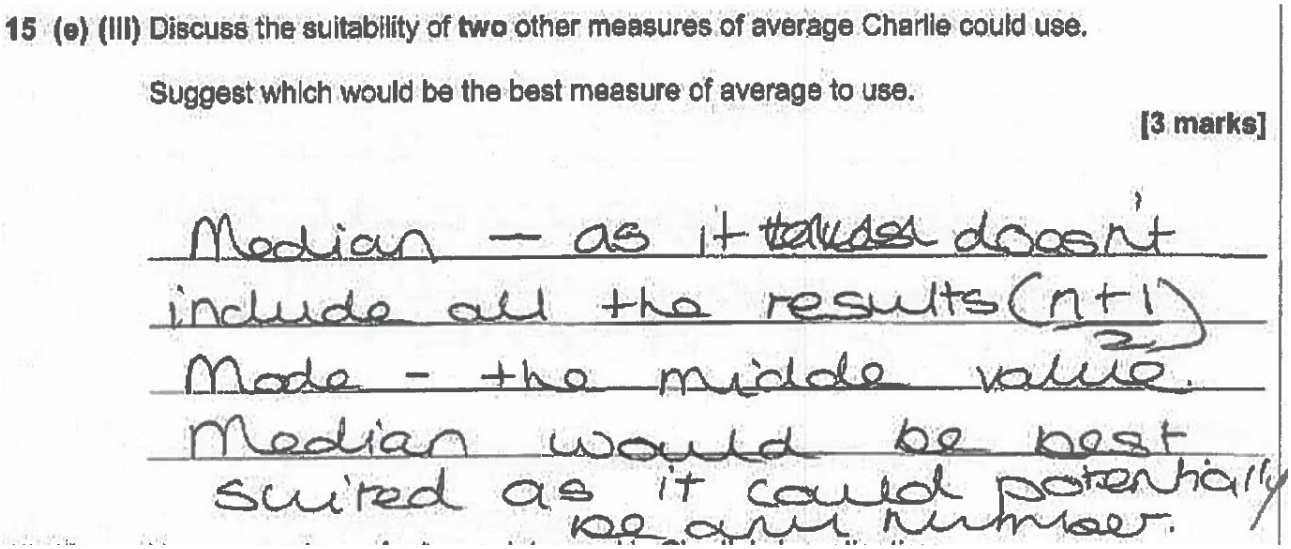
[3 marks]

Student A

15 (e) (iii) Discuss the suitability of **two** other measures of average Charlie could use.

Suggest which would be the best measure of average to use.

[3 marks]



Commentary

There is clearly confusion here as to the definitions of the different types of average, however the act of successfully naming two of them is still worth one mark.

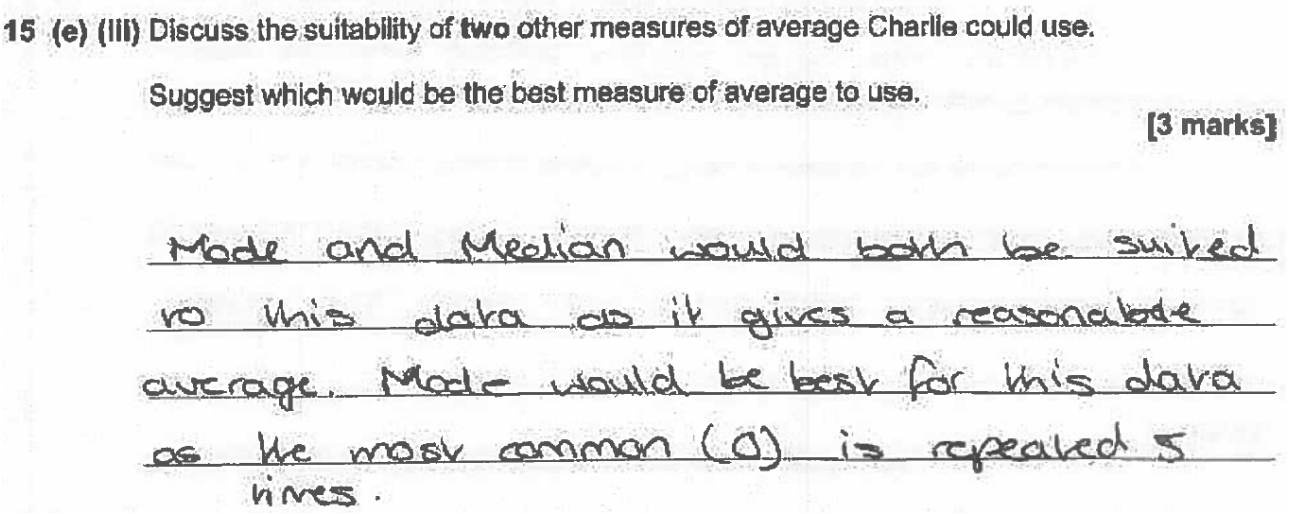
1 mark

Student B

15 (e) (iii) Discuss the suitability of **two** other measures of average Charlie could use.

Suggest which would be the best measure of average to use.

[3 marks]



Commentary

A good response citing the two types of average and giving a reason for using the mode. However, for full marks, it is considered that the median should be the chosen measure in this context and with these data.

2 marks

Student C

15 (e) (iii) Discuss the suitability of two other measures of average Charlie could use.

Suggest which would be the best measure of average to use. [3 marks]

Mean
Range
Mode
Median

Median would give Charlie the middle amount people used a train. The mode would give the most average answer, which would be best for Charlie to use as it's more accurate.

Commentary

Insufficient detail / insight to score anything beyond the mark for naming the two measures of average.

1 mark

Question 15(f)

15 (f) Name **one** piece of primary data used in Charlie's investigation.

[1 mark]

Student A

15 (f) Name **one** piece of primary data used in Charlie's investigation.

[1 mark]

The amount of train journeys taken by his friends.

Commentary

Correct response

1 mark

Student B

15 (f) Name **one** piece of primary data used in Charlie's investigation.

[1 mark]

among her friends

Commentary

This is not clear enough about the actual data which is being referred to.
0 marks

Question 15(g)

15 (g) Name **one** piece of secondary data used in Charlie's investigation.

[1 mark]

Student A

15 (g) Name **one** piece of secondary data used in Charlie's investigation.

[1 mark]

The use of the graph

Commentary

The only graph in the question is the secondary data regarding vehicles and trains, so is accepted as an answer here.
1 mark

Student B

15 (g) Name **one** piece of secondary data used in Charlie's investigation.

[1 mark]

the news.

Commentary

Judged as too vague a reference to this particular context.
0 marks

Question 15(h)

15 (h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]

Student A

15 (h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]

could have ignored the essreme value/result.

Commentary

This response is not about the data collection, but instead is about how the data was processed once collected.
0 marks

Student B

15 (h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]

[redacted] do a random sample of people to ask

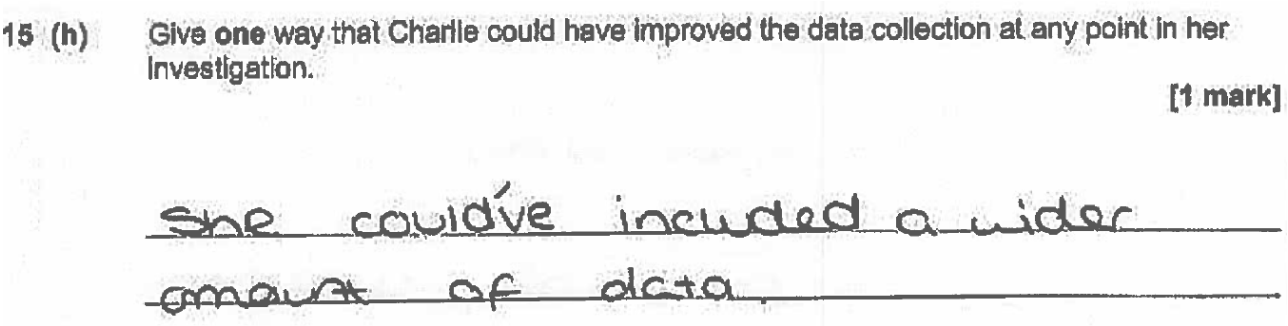
Commentary

A suitable response.
1 mark

Student C

15 (h) Give **one** way that Charlie could have improved the data collection at any point in her investigation.

[1 mark]



Commentary

Judged as an acceptable reference to obtaining a greater amount of data.

1 mark