



GCSE STATISTICS 8382/1F

Foundation Tier Paper 1

Mark scheme

June 2019

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Statistics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq \text{value} < b$
3.14 ...	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Question	Answer	Mark	Comments
1	Raw	B1	
2	Temperature	B1	
3	Mean	B1	
4	$\frac{1}{2}$	B1	

Question	Answer	Mark	Comments																			
5(a)	Headings of : Time (minutes) Frequency	B1	Condone omission of (minutes)																			
	Tallying method with 5 bar gates used and all correct	B2	B1 tallying method without 5 bar gates used but otherwise correct B1 tallying method with 5 bar gates used and three or four correct																			
	Correct frequencies for their tallying	B1ft	ft as long as all non-zero																			
	Additional Guidance																					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Time (minutes)</th> <th style="width: 33%;">Tally</th> <th style="width: 33%;">Frequency</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;"> </td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;"> </td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;"> </td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;"> </td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;"> </td> <td style="text-align: center;">1</td> </tr> </tbody> </table>			Time (minutes)	Tally	Frequency	0		4	1		7	2		5	3		3	4		1	B4
	Time (minutes)	Tally	Frequency																			
	0		4																			
	1		7																			
	2		5																			
	3		3																			
4		1																				
Accept minutes, min, number of mins etc for Time																						
Do not accept number or m for Time																						
Accept total, freq, f etc for Frequency																						
Do not accept number or frequency density for Frequency																						

Question	Answer	Mark	Comments
5(b)	44 identified	B1	May be identified on the diagram
	Remove from data or Assume it was intended to be a 4	B1	oe eg clean the data
	Additional Guidance		
	Allow the problem to be mentioned in the suggestion and vice-versa or both in one statement		
	If more than one problem or more than one suggestion given ignore unless contradictory		
	To score the first B1 the 44 must be mentioned or identified on the diagram (the 44 can be referenced in the suggestion)		
	44 is an outlier		First B1
	44 identified but the student thinks the data is recorded correctly		First B0
	There is an outlier		First B0
	The problem is the large range of 44 minutes (inappropriate reference to 44)		First B0
	Condone it was intended to be two 4s (they missed out the space)		B1B1
	Repeat the collection of data		Second B1
5(c)	(Nearly) all data has been under 5 minutes (so not a good idea)	B1	oe
	Additional Guidance		
	Allow students to assume that the outlier has been removed allowing them to comment that all of the data is under 5 minutes		
	There would only be one (or two) groups		B1
	He should do it in groups of 2 minutes (allow 1, 2 or 3)		B1
	Referring to the average being below 5 minutes		B0

Question	Answer	Mark	Comments
6(a)	10 (houses)	B1	
	Additional Guidance		
	Ten (houses)		B1
	10 out of 20		B1
	$\frac{10}{20}$		B0
6(b)	20×0.1 or $20 \times 0.9 = 18$ and $20 - 18$	B1	oe
	Additional Guidance		
	10% of 20 is 2 (method for 10% not shown)		B0
	90% of 20 is 18, $20 - 18 = 2$ (method for 90% not shown)		B0
6(c)	Sunny, sunny and heavy rain (in any order)	B2	B1 54 – 12 or 42 or 100 – 54 or 46 or 20 20 2 (in any order) or 32 52 54 or 32 34 54 or 14 34 54
	Additional Guidance		
	Mark intention so allow H or heavy for heavy rain, S or sun for sunny etc		
	Table takes precedence, ignore any working with the correct answer given in the table		

Question	Answer	Mark	Comments
6(d)	Alternative method 1		
	12 × 5 or 60	M1	
	60 so more than the expected number actually cleaned	A1	oe
	Alternative method 2		
	54 ÷ 5 or 10.8	M1	
	10.8 so more than the expected number actually cleaned	A1	oe
	Additional Guidance		
	54 ÷ 5 = 11, so more than the expected number actually cleaned		M1A1
	He cleans 6 more (windows) than expected		M1A1
	60 is bigger than 54		M1A1
The actual is (on average) 1.2 more than the expected (1.2 can be 1 with working shown)		M1A1	

Question	Answer	Mark	Comments
6(e)	Valid reason	B1	eg Perhaps more people wanted their windows cleaning than expected during the light rain / heavy rain days Perhaps Quin's percentages were wrong Perhaps Quin had missed these houses last time so more wanted them doing It is only a small sample
	Additional Guidance		
	Quin might gain new customers during the week		B1
	Any reference to the weather changing		B0
7(a)	Census	B1	
7(b)	It will take a very long time or It will be (very) difficult to achieve or It will give too much data	B1	oe
	Additional Guidance		
	Some people might not give an answer (so it will be difficult to achieve)		B1
	Some people may be too young (to comment)		B1
	It will take too long		B1
	Too many people to ask (them all)		B1
	Too many people (vague)		B0
	It would be biased		B0
	It will take longer		B0
	She'll have to ask everyone		B0

Question	Answer	Mark	Comments	
7(c)	How far do you live from the (fracking) site?	B1	oe Suitable question	
	At least 3 numerical option boxes which are exhaustive and non-overlapping	B2	B1 At least 3 numerical option boxes which are exhaustive or non-overlapping	
	Additional Guidance			
	Mark intention, condone missing boxes			
	Ignore units			
	Response section marks can be awarded with an incorrect question as long as the question lends itself to a response section where numerical option boxes can be used			
	In the response section ignore any box labelled other or don't know			
	10+ can mean 10 or more or more than 10 for example			
	Allow data to be discrete, eg 0-3 4-6 7-10 10+ scores 2			
	Condone gaps of no more than 0.1 for the exhaustive mark			
	If inequality signs are used they must be fully correct for B2, but for B1 condone misuse of strict or inclusive inequality signs If any inequality sign is facing the wrong way then B0			
	Response section: Yes No Don't know			B0

Question	Answer	Mark	Comments
7(d)(i)	What is your age? or What is your date of birth?	B1	oe Suitable question
	Additional Guidance		
	Ignore any answer line offered but must not have option boxes or this is now a closed question		
	How old will you be when the fracking starts?	B1	
	What is your year of birth?	B1	
	What age group are you in? (implies closed question)	B0	
	Any mention of tick a box	B0	
	When is your birthday? (normally doesn't include year)	B0	
7(d)(ii)	No ticked and May put people off answering or No ticked and (More) difficult to process or Yes ticked and Achieves precise data	B1	oe Can be a negative or positive comment as long as relevant
	Additional Guidance		
	Yes, open questions allow more variety of answers	B1	
	No, people may lie (as they don't want to reveal their age)	B1	
	No, makes it difficult to compare	B1	
	If the box contradicts the statement then B0	B0	
	No it's quicker to use grouped ages (not really, quicker to just write a number than find the correct age group)	B0	
	People may not answer correctly/accurately/properly	B0	

Question	Answer	Mark	Comments
7(e)	Two correct from: Shouldn't use 'Do you agree' or Asking two things at once or Uses emotive words	B2	oe B1 One correct from: Shouldn't use 'Do you agree' or Asking two things at once or Uses emotive words
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	Two criticisms may be mentioned in one statement		
	It's leading, and dangerous and damages are strong words	B2	
	Biased question / Leading question	B1	
	A focus on fracking or countryside	B0	
	It is confrontational	B0	

Question	Answer	Mark	Comments																																																
8(a)	One correct row or column	M1																																																	
	Fully correct	A1																																																	
	Additional Guidance																																																		
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8(b)(i)	$\frac{3}{36}$ or 0.083(33...) or 8.3(33...)%	B2ft	ft their table as long as complete oe fraction eg $\frac{1}{12}$ B1 for correct numerator from their diagram B1 for correct denominator of 36 only																																																
	Additional Guidance																																																		
	Ignore attempt to simplify correct fraction or change format (except ratio)																																																		
	Do not ignore ratio, eg $\frac{3}{36} = 3 : 36$		B1																																																
	3 out of 36		B1																																																
	3 : 36		B1																																																
3		B0																																																	

Question	Answer	Mark	Comments
8(b)(ii)	Identifies 15 outcomes	M1	May be on diagram or as numerator of fraction
	$\frac{15}{36}$ or 0.416(66...) or 0.417 or 0.42 or 41.6(66...) % or 41.7% or 42%	A1	oe fraction eg $\frac{5}{12}$
	Additional Guidance		
	Ignore attempt to simplify correct fraction or change format (except ratio)		
	Do not ignore ratio, eg $\frac{15}{36} = 15 : 36$		M1A0
	15 out of 36		M1A0
	15 : 36		M1A0
	15 (unless clearly from wrong working)		M1A0
9(a)	$\frac{200}{800} (\times 60)$	M1	oe eg sight of $\frac{1}{4}$
	15	A1	

Question	Answer	Mark	Comments
9(b)	He may not get a response from every manager (he emails) or (He may need to send) an email to remind managers to respond to the questionnaire or Rogan may acknowledge returns of completed questionnaires (by email)	B1	oe
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	Some managers might not see the email in their inbox and they may need to be sent a reminder		B1
	Some managers might not see the email in their inbox		B0
	(Some of the) hotels might have more than one manager		B0
10(a)	30 – 39	B1	
10(b)	This is the midpoint of the group	B1	oe
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	It's in the middle		B1
	It's halfway (between range)		B1
	It's in the middle as 24.5 rounds to 25		B0
	It's the median		B0

Question	Answer	Mark	Comments
10(c)	Completely correct (correct points joined by line segments)	B2	$\pm \frac{1}{2}$ square tolerance B1 correct heights and joined but one error on midpoints or B1 correct midpoints and joined but one error on heights or B1 all correct points but not joined
10(d)	The modal group is the same (for both countries)	B1ft	oe Strict follow through from their (a)
	Additional Guidance		
	When marking this part you have to ft their part (a) with 30-39 for Norway		
	Both are 30-39 (so they are the same)	B1	
	Ireland is 30-39, Norway is 30-39	B1	
	In Norway and Ireland teachers are more likely to be 30-39	B1	
In Norway and Ireland 30-39 year olds are likely to be teachers	B0		

Question	Answer	Mark	Comments
10(e)	Ticks It is not possible to tell which range is larger and gives a correct reason eg We do not know the actual maximum and minimum values	B2	oe B1 for Ticks It is not possible to tell which range is larger
	Additional Guidance		
	If the correct box has been ticked: the groups are the same it's grouped data they are plotted at the midpoints it doesn't give the extra data	B1B0 B1B0 B1B0 B1B0	
10(f)	Any correct comparison eg Ireland has a greater percentage of young teachers or From 20-29 to 30-39 the percentage increases for Ireland and for Norway	B1	oe eg Norway has a greater percentage of old teachers or From 30-39 to 40-49 the percentage decreases for Ireland and for Norway
	Additional Guidance		
	Allow 'young' as a reference to the first age group		
	Allow 'old' as a reference to the final age group		
	Allow similar percentages for 30-39 or similar percentages for 40-49		
	The second highest group is 50-59 (for both)	B1	
	They are both distributed in a similar way	B1	
	They are both M shaped	B0	
	They go up and down in the same way (no reference to age group)	B0	
There are no ages below 20 and above 69	B0		

Question	Answer	Mark	Comments
11(a)	Three correct from: No label(s) or There is a problem with the key or Inappropriate type of diagram or Points should not be joined with full lines (the lines/bars should go up) or Intermediate parts of lines have no meaning or Hard to read off (because the years are slanted) or There are differing gaps between years	B3	oe B2 for two correct B1 for one correct
Additional Guidance			
Ignore irrelevant statements unless contradictory			
More than one criticism may be in one statement			
It should have been a vertical line graph / bar chart / dot plot (so the diagram is inappropriate)			B1
The key is pointless			B1
Hard to read			B1
Unclear (too vague)			B0

Question	Answer	Mark	Comments
11(b)	Any diagram suitable for discrete quantitative data (over time)	B1	eg bar chart, vertical line diagram
	Additional Guidance		
	Stem-and-leaf / pie chart / scatter diagram / frequency polygon / line graph		B0
	Condone the interchanging use of words chart, graph and diagram eg bar graph		B1
12(a)	2007	B1	
12(b)	From 2000 to 2010/2011 the number was (usually) increasing... and Since 2010/2011 the number has (usually) decreased	B2	oe B1 for From 2000 to 2010/2011 the number was (usually) increasing... or Since 2010/2011 the number has (usually) decreased or Reference of a year which bucked the general trend at that point, eg 2001, 2008, 2015
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	A range of at least 5 years must be given to score, unless making reference to a year that bucks the general trend		
	Allow reference to 2000s to mean 2000/2001 to 2009/2010		
	Both marks may be scored in one sentence eg In the 2000s the numbers were usually on the up but after 2010 they have usually fallen eg Increases until 2010 then decreases		B2 B2

Question	Answer	Mark	Comments
12(c)	There will have been a different overall number (of Under 16s) in the two years	B1	oe eg it's out of different (total) numbers
	The source is a reliable one	B1	oe eg it's the ONS (so they should know what they are talking about)
	Additional Guidance		
	Any mention of the source is B1 unless the response contradicts its reliability		
	Data comes from the ONS which will have got it from hospitals		B1
	Data comes from hospitals		B0
13(a)	24p	B1	
13(b)	$\frac{62}{12} (\times 100)$	M1	oe
	517	A1	516.(...) implies M1
	Additional Guidance		
	Trial and improvement or build up is 0 or 2		

Question	Answer	Mark	Comments
14(a)	$15 \times 5 + \frac{2}{5} \times 15$ or 81 or $15 \times 3 + \frac{4}{5} \times 15$ or 57 or $5.4 - 3.8$ or 1.6 or $1\frac{3}{5}$ or $15 \div 5 = 3$ (may be seen on the diagram)	M1	oe eg 2 parts = 6
	$81 - 57 = 24$ or $24 \div 1.6 = 15$ or $15 \div 5 = 3$ and $3 \times 8 = 24$	A1	oe
	Additional Guidance		
	$57 - 81 = 24$		M1A0

Question	Answer	Mark	Comments
14(b)	6.8×15 or 102 or 5.4×15 or 81	M1	oe Implied by 0.10(78....) or 0.11(11....)
	$\frac{11}{\text{their } (6.8 \times 15)}$ or 0.10(78....) or $\frac{11}{102}$ or $\frac{9}{\text{their } (5.4 \times 15)}$ or 0.11(11....) or $\frac{9}{81}$	M1dep	oe
	Ticks 'No' and $0.10(78....)$ or $\frac{99}{918}$ or $\frac{891}{8262}$ and $0.11(11....)$ or $\frac{102}{918}$ or $\frac{918}{8262}$	A1	oe
	Additional Guidance		
	Allow 11 out of 102 (or 9 out of 81) for first M1		
	For the A1 mark, the proportions must be written in a form where they can be directly compared (eg decimals, percentages or fractions with a common denominator)		
	Allow decimals or percentages to be correctly truncated to 2sf or better, but with rounding answers must be correct to 3sf or better		
Example of oe instead of 6.8 or 5.4 $\frac{34}{5}$ or $\frac{27}{5}$			
Use of reciprocals is M1 max (unless recovered) eg $\frac{102}{11}$			M1M0
$\frac{11}{34}$ or $\frac{9}{27}$ (is M0 unless recovered by dividing by 3)			M0

Question	Answer	Mark	Comments
14(c)	Alternative Method 1 – using 15		
	$6.8 \times 15 + 5.4 \times 15 + 3.8 \times 15$ or 16×15 or $102 + 81 + 57$ or 240	M1	oe Sum of three products/totals, at least two correct
	(their $240 \div 10$) – 11 – 9 or 4	M1	oe their 240 must come from the addition of three numbers
	Correctly completed bar chart with height of 4 label (Stourness Woods) same gap between 2 nd and 3 rd bars as between first two bar width equal to the other 2 bars	A1	
	Alternative Method 2 – using 10% of 15		
	$6.8 \times 1.5 + 5.4 \times 1.5 + 3.8 \times 1.5$ or 16×1.5 or $10.2 + 8.1 + 5.7$ or 24	M1	oe Sum of three products/totals, at least two correct
	their 24 – 11 – 9 or 4	M1	oe their 24 must come from the addition of three numbers
	Correctly completed bar chart with height of 4 label (Stourness Woods) same gap between 2 nd and 3 rd bars as between first two bar width equal to the other 2 bars	A1	
	Additional guidance for this question is on the next page		

14(c)	Additional Guidance									
	<p style="text-align: center;">Number occupied</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Woods</th> <th>Number occupied</th> </tr> </thead> <tbody> <tr> <td>Staple Woods</td> <td>11</td> </tr> <tr> <td>East Valley Woods</td> <td>9</td> </tr> <tr> <td>Stourness Woods</td> <td>4</td> </tr> </tbody> </table>		Woods	Number occupied	Staple Woods	11	East Valley Woods	9	Stourness Woods	4
	Woods	Number occupied								
	Staple Woods	11								
East Valley Woods	9									
Stourness Woods	4									
Do not assume that their bar of height 4 is from correct working										
Embedded 4 from correct working eg $11 + 9 + 4$		M1M1								

15(a)	How do you (usually) travel to school?	B1	oe options not required
	Additional Guidance		
	Ignore any options / response boxes		
	Ignore time period		
	Condone school to home		
	Which way do you travel to school? (ignore ambiguity)		B1
	How do you usually travel?		B0

Question	Answer	Mark	Comments
15(b)	True, 3 out of 30 (is 10%) or (True,) 3 out of 30 is 10%	B1	oe
	(Probably) false, there is no way of knowing whether Charlie's data is representative of the whole school	B1	oe
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	Accept yes/right/correct for true and no/wrong/incorrect for false etc		
	False can be implied in the second B1 by a full correct description		
	First B1		
	Yes, 1 out of 10 is equal to 3 out of 30		B1
	It is correct because $\frac{1}{10}$ travel to school		B0
	True, $30 \div 3 = 10(\%)$		B0
	Correct, 10% do travel by car		B0
	This is wrong ...		B0
	Second B1		
	It's only a sample (implies false)		B1
	It could be different for all students (implies false)		B1
	Wrong because in every 30 people there isn't always 3 that travel by car		B1
	False because there are a lot more students than friends		B1
	Haven't got enough data to work that out (implies false)		B1
	Should have done a census (implies false)		B1
	A sample isn't always representative (implies false)		B1
It's a sample (does not imply false)		B0	

Question	Answer	Mark	Comments	
15(c)(i)	The general trend is increasing (so more people are using cars to travel) or No / not confirmed as the graph only shows increase in (passenger) km travelled (not number of people travelling) or No / not confirmed as increase could be in numbers of taxis/vans	B1	oe	
	Additional Guidance			
	Ignore irrelevant statements unless contradictory			
	Positive gradient implies increasing			
	Decision can be implied			
	Allow passenger but not number of passengers for passenger km			
	Do not allow people for passenger km			
	It's likely that more people are using cars to travel as it (implies graph) increases			B1
	No because the line includes cars, vans and taxis			B1
	No because more people could be using taxis and vans			B1
	No, it does not show cars alone			B1
	Condone positive correlation/trend			B1
	Yes, it's increasing (implies graph)			B1
	True as the graph slightly increases (slightly so could be referring to rail travel)			B0
	Reference to car sharing or population increase			B0
	Over time more people have opted for the road rather than rail			B0
	The graph confirms it			B0
	It does confirm as it shows the number of passengers using cars			B0
	It might not be people using their cars but that they are driving further			B0
	There is an increase in the amount of people travelling in a car			B0

Question	Answer	Mark	Comments
15(c)(ii)	There is no information on how many (more) roads have been built / cars on the road so it is not possible to tell (if roads are getting busier) or It is likely that roads are getting busier due to the (large) increase in the (passenger) km travelled	B1	oe
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	Allow passenger but not number of passengers for passenger km		
	Do not allow people for passenger km		
	If there is an increase in passengers, there will probably be an increase in cars so the roads are busier (B0 without the 'probably')	B1	
	This might be true but an increase in passengers does not mean an increase in cars	B1	
	We cannot tell as roads might have got bigger	B1	
	It doesn't show that the roads are busier, just that there are more passengers	B1	
	The graph doesn't show that roads are busier but there will probably be a positive correlation with the number of miles travelled	B1	
	True ... / Yes ... / Confirmed ...	B0	
	The graph doesn't show that roads are busier but there will probably be a correlation with the number of miles travelled	B0	
	We cannot tell. This shows the number of passengers not cars	B0	
	Higher number of cars doesn't mean the roads are definitely busier	B0	
	Roads are getting busier because there are more cars, vans and taxis	B0	
	Cannot tell, the number of passengers is increasing but number of cars might be the same or less (implies car sharing)	B0	
	Cannot tell as the graph doesn't tell us anything about how busy the roads are	B0	
	It might be true or it might be that cars are driving further	B0	
Reference to car sharing	B0		

Question	Answer	Mark	Comments
15(d)	Two correct statements eg (Slight) decrease at the start or (From 1952) train travel was constant/steady (for many years) or (In recent years) it has increased or Numbers always been less than road or Rail travel was never bigger than 100 billion (passenger) km	B2	oe B1 for one correct statement Allow [60, 100] for 100
	Additional Guidance		
	Ignore irrelevant statements unless contradictory		
	Allow passenger but not number of passengers for passenger km		
	Do not allow people for passenger km		
	Do not allow B2 for two comparative statements (about car and rail)		
	Do not allow B2 if there are two contradictory statements eg Steady over the period, increases over the period It's been steady but increased It's been (mostly) steady over the years. It increased at the end / around 2016		B1 B1 B1
	Both marks can be awarded in the same sentence eg Mostly stayed the same but increased a bit over the last few years It's been steady (but) then increased		B2 B2
	An increase between 1952 and 2016		B1
	2016 value higher than 1952 value		B1
	It's highest in 2016 (doesn't reference travel over the years)		B0

Question	Answer	Mark	Comments	
15(e)(i)	(Arithmetic) mean	B1		
	Sight of $408 \div 12 (= 34)$	B1	oe	
	Additional Guidance			
	408 may be seen as list of additions (with or without zeros)			
	Condone missing brackets when adding numbers and dividing by 12			
	Do not ignore an incorrect answer for 408 or 34			
15(e)(ii)	Not a good measure of average in this case due to the (large) outlier	B1	oe eg not good due to the 387	
	Additional Guidance			
	Any additional statements must be correct			
	Accept anomaly, extreme value etc for outlier			
	The mean/average is unrepresentative of the data			B1
	One result is a lot bigger than the rest so not a good measure			B1
	One result is bigger than the rest so not a good measure			B0
	It's not very accurate due to the outlier			B0
It's the odd one out / biggest			B0	

Question	Answer	Mark	Comments
15(e)(iii)	Two from: Mode or Median or Geometric mean	B1	This mark can be implied by two following statements
	Use median as it gives a reasonable (middle) value / is not affected by outlier and Mode gives an answer which is the lowest value of the data (so it is not suitable) or Geometric mean gives an answer which is the lowest value of the data (so it is not suitable) or Geometric mean is not suitable in this context	B2	oe B1 for one of Median as it gives a reasonable (middle) value / is not affected by outlier or Mode gives an answer which is the lowest value of the data (so it is not suitable) or Mode is 0 and is representative as it appears 5 times (out of 12) / nearly 50% / frequently or Geometric mean gives an answer which is the lowest value of the data (so it is not suitable) or Geometric mean is not suitable in this context
	Additional Guidance		
	For B3 must choose median (and reject the other average)		
	Allow outlier ignored/eliminated/excluded for 'not affected by outlier'		
	Mode may be selected as the best measure of average to use for B2 max		
	Mode is 0 is not enough to imply lowest value of the data		
Median is 1 is not enough to imply a reasonable value			

Question	Answer	Mark	Comments
15(f)	How Charlie's friends travel to school or How many times her friends had used a train	B1	oe eg friends' answers
	Additional Guidance		
	The frequency table (implies how Charlie's friends travel to school)		B1
	Questionnaire answers (implies the answers to the question from part (a))		B1
	Asking her friends (how many times they have used the train) (this is not the data)		B0
	The raw numbers		B0
	The data		B0
15(g)	The transport information (from the website) or The graph (from the website) or The billion (passenger) km per year	B1	
	Additional Guidance		
	650 billion passenger km in 2016		B0
	The (news) website		B0
	(The) Department for Transport		B0

Question	Answer	Mark	Comments	
15(h)	Obtain more data or Don't just ask her friends or Use (random) sampling to choose who to ask or Use more than one website	B1	oe	
	Additional Guidance			
	Use a stratified sample (implies asking people other than friends)		B1	
	Census (implies everyone in her school)		B1	
	Ask more friends		B0	
	Reference to the outlier		B0	