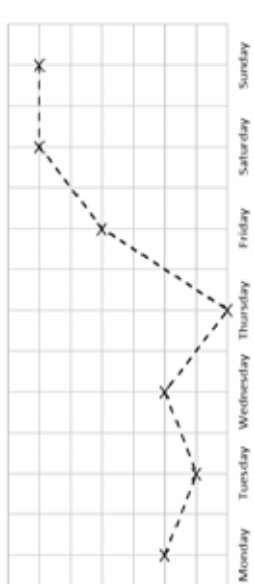


## Paper 2 Foundation tier mark scheme

Question number	Answer	Additional guidance	Mark
1(a)	B1 It is a leading question / it is biased	B1 for assessing the appropriateness of the given question	(1)
1(b)	<p>B2 for a complete answer, e.g.</p> <ul style="list-style-type: none"> <li>• Not suitable AND the response boxes overlap</li> <li>• Not suitable AND no option for never / cannot say 6 or more</li> </ul> <p>OR if B2 not earned...</p> <p>B1 for an incomplete answer e.g. giving reasons but no conclusion</p> <p>OR</p> <p>B1 for one of</p> <ul style="list-style-type: none"> <li>• Contains a time frame</li> <li>• It is a closed question which is better than an open question</li> </ul>	<p>B2 for assessing the appropriateness of the given question and reaching the correct conclusion</p> <p>OR if B2 not earned... B1 for an incomplete attempt at assessing the appropriateness of the given question</p>	(2)

Question number	Answer	Additional guidance	Mark
2(a)	B1 All people/items have the same/equal chance of being chosen.	B1 for demonstrating understanding of a random sample	(1)
2(b)	<p>B1B1B1 for each of three aspects from:</p> <ul style="list-style-type: none"> <li>• Get a list / register (as the sampling frame) of all the students in the school or</li> <li>• Number the students in the (sampling frame) list / register</li> <li>• Generate random numbers using a calculator / computer / random number table</li> <li>• Students with the matching number are selected</li> </ul>	B1×3 for demonstrating understanding of how to select a random sample	(3)
2(c)	<p>B2 for a complete answer e.g. the plan is appropriate <b>AND</b> e.g. the number of hours spent on homework might differ between school years</p> <p>OR if B2 not earned... B1 for an incomplete answer e.g. the plan is appropriate, with an attempt at a reason OR for correct reason without conclusion</p>	<p>B2 for complete answer assessing the appropriateness of the suggested plan</p> <p>OR if B2 not earned... B1 for an attempt at assessing the appropriateness of the suggested plan</p>	(2)

Question number	Answer	Additional guidance	Mark
<b>3(a)</b>	B1 car (cao)		<b>(1)</b>
<b>3(b)</b>	B1 train (cao)		<b>(1)</b>
<b>3(c)</b>	<p>B1 for any one limitation of Razwan’s conclusion</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• The data only relates to people working at one company</li> <li>• The data only relates to one morning / people might use different transport on other days</li> <li>• This is only a small sample</li> </ul>	B1 for a comment assessing the stated conclusion	<b>(1)</b>
<b>4</b>	<p>B1B1B1 for three correct things identified.</p> <p>e.g.</p> <ul style="list-style-type: none"> <li>• No label for the third row</li> <li>• Different shaped symbols (triangles and rectangles)</li> <li>• Different sized symbols / symbols not aligned</li> <li>• No key</li> <li>• No title</li> </ul>	B1 ×3 for demonstrating understanding of key features of a pictogram	<b>(3)</b>

Question number	Answer	Additional guidance	Mark
5(a)	B1B1B1 	1 <sup>st</sup> B1 for plotting points correctly 2 <sup>nd</sup> B1 for correctly connecting points with straight lines 3 <sup>rd</sup> B1 for labelling both axes ( <i>hours</i> for vertical axis and <i>days of week</i> for horizontal axis)	(3)
5(b)	M1 $\frac{2 + 1 + 2 + 0 + 4 + 6 + 6}{7}$ A1 3	M1 for appropriate addition and division by 7 (condone one error) A1 cao	(2)
5(c)	M1 0 1 2 2 4 6 6 A1 2	M1 for ordering or using $(n+1)/2$ A1 cao	(2)
5(d)	B1ft Diane has a lower mean than Noah. B1ft Diane has a higher median than Noah.	B1 for each correct statistical conclusion (follow through their values in (b) and (c))	(2)

Question number	Answer	Additional guidance	Mark
<b>6(a)</b>	<p>B1B1 for two correct problems e.g.</p> <ul style="list-style-type: none"> <li>• Data may not be up to date</li> <li>• Data may not be in the required format</li> <li>• Some data may be missing</li> <li>• Reliability of website may not be known</li> </ul>		<b>(2)</b>
<b>6(b)</b>	<p>B1</p> <ul style="list-style-type: none"> <li>• Rugby team mean &gt; football team mean</li> </ul> <p>B1</p> <ul style="list-style-type: none"> <li>• Rugby team range &gt; football team range</li> </ul> <p>B1 e.g.</p> <ul style="list-style-type: none"> <li>• the rugby team are heavier / football team are lighter</li> <li>• the rugby team have less consistent weights / the football team have more consistent weights</li> </ul>	<p>B1B1 for correct statistical reasoning comparing means and ranges</p> <p>B1 for contextual interpretation of a comparison of means or ranges</p>	<b>(3)</b>
<b>6(c)</b>	E.g. not able to access all of the players	B1 for any suitable appreciation that secondary data is appropriate	<b>(1)</b>

Question number	Answer	Additional guidance	Mark
7(a)(i)	B1 Positive correlation	B1 for correct statistical conclusion	(1)
7(a)(ii)	B1 The judges were in reasonable/good agreement	B1 for contextual interpretation of conclusion	(1)
7(b)	B1 for answer with reason, e.g. <ul style="list-style-type: none"> <li>No AND reference to the change in context (sponge cakes versus flower arranging)</li> <li>Yes, likely to give similar ranks AND reference to the fact that the judges have similar tastes</li> </ul>		(1)
8(a)	B1 24		(1)
8(b)	B1 19.5 (allow answers in the range 19.4-19.6)		(1)
8(c)	B1 Line drawn between (170, 19)/(170, 20) and (270, 24)/(270, 25)		(1)
8(d)	B1 Positive B1 Strong B1 As the total number of hours of sunshine increases, the mean maximum temperature increases.	A response that covers all 3 aspects can score 3 marks	(3)
8(e)(i)	B1ft 21.5 - 22.5	B1 for answer in range 21.5 - 22.5 or follow through value read off their line of best fit with positive gradient.	(2)
8(e)(ii)	B1 e.g. 'The result has been interpolated'	B1 for understanding that the estimate is made within the range of given $x$ - values	(2)

Question number	Answer	Additional guidance	Mark
9(a)	M1 28000 – 15000 A1 13000	M1 for use of 28000 and 15000	(2)
9(b)	B1 for e.g. 'Exact values can't be read off graph' or 'As values came from a possibly unreliable source (secondary data) they could be inexact' B1 for downwards	B1 for reason relating to actual values are unknown/source of data may be unreliable	(1)
9(c)	B1 for downwards	B1 for a correct description of the trend	(1)
9(d)	B1 for e.g. 'It would not be appropriate to do this as the time series graph only shows information for 2 subjects (and not all subjects)'	B1 for not appropriate with correct supporting reason	(1)
9(e)	B1 for e.g. 'By only showing the data from 2014 onwards'	B1 for selecting the part of the data set which shows this information	(1)
9(f)	B2 for e.g. 'Not appropriate since trend may not continue'	B2 for assessing the use of the time series graph to predict future with appropriate conclusion  OR B1 for 'Not appropriate' with incomplete reasoning	(2)

Question number	Answer	Additional guidance	Mark								
<b>10(a)</b>	B2 <table style="border-collapse: collapse; margin-left: 20px;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">0</td><td>5566789</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">1</td><td>22223336</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">2</td><td>012223344</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">3</td><td>045</td></tr> </table>	0	5566789	1	22223336	2	012223344	3	045	B2 cao  OR if B2 not earned B1 for unordered diagram or ordered diagram with at most 2 errors	<b>(2)</b>
0	5566789										
1	22223336										
2	012223344										
3	045										
<b>10(b)</b>	M1 $23 - 9$ A1 $= 14$	M1 for attempt at IQR with at least one quartile (23 or 9) correct A1 for 14 cao	<b>(2)</b>								
<b>10(c)</b>	B1 for adult median is 13  B1ft for the median for the adults is higher than the median of the children  B1ft (dep) so yes Alex's conclusion is supported by the data.	B1 adult median is 13 B1 for correct comment assessing the appropriateness of the conclusion  3 <sup>rd</sup> B1 is dependent upon the 2 <sup>nd</sup> B1	<b>(3)</b>								
<b>11</b>	B1 Top right of grid  B1 Squares are shaded darkest in this region.	B1 for a correctly identifying the region (e.g. NE corner) B1 for a statistical reason relating to use of the key.	<b>(2)</b>								
<b>12(a)</b>	B1 quantitative B1 continuous	B1 for one identified B1 for both identified with no extras	<b>(2)</b>								
<b>12(b)(i)</b>	M1 <table style="border-collapse: collapse; margin-left: 20px;"> <tr><td style="border: 1px solid black; padding: 2px;">16</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">44</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">30</td></tr> </table> A1	16	44	30	M1 for correctly applying a scale to find a second value (implied either by labelling a scale or correctly finding one other frequency). A1 for all values correct.	<b>(2)</b>					
16											
44											
30											
<b>12(b)(ii)</b>	M1M1A1 $\frac{2 \times 10 + 4 \times 16 + 6 \times 44 + 8 \times 30}{100} = 5.88$	M1 for consistent use of $fx$ with $x$ within interval M1 for correct use of $\Sigma fx$ with $x$ the mid-interval value A1 for 5.88	<b>(3)</b>								

Question number	Answer	Additional guidance	Mark
13(a)(i)	B1 (0.3+0.4=) 0.7	For probability answers accept equivalent fractions, decimals or percentages	(1)
13(a)(ii)	B1 0.3		(1)
13(a)(iii)	M1 $\frac{0.3}{0.5}$ A1 0.6		(2)
13(b)	M1 $0.8 \times 0.5$ A1 0.4		(2)

Question number	Answer	Additional guidance	Mark
14	<p><b>Collecting data</b>            B1 for identifying one appropriate thing that should be included in the plan for collecting data <b>and</b>            B1 for explaining why this aspect is appropriate            OR            B1 for deciding what data to collect and/or how to collect and record it <b>and</b>            B1 for an appropriate reason            OR            B1 for a strategy to process data <b>and</b>            B1 for an appropriate reason            OR            B1 for designing a collection method for primary/secondary data <b>and</b>            B1 for an appropriate reason            OR            B1 for appreciating the importance of acknowledging sources <b>and</b>            B1 for an appropriate reason            OR            B1 for recognising where issues of sensitivity may influence data availability <b>and</b>            B1 for an appropriate reason</p> <p><b>Processing and presenting</b>            B1 for planning to organise and/or process data <b>and</b>            B1 for an appropriate reason            OR</p>	<p>B1B1B1 for each of three planned elements and B1B1B1 for each of three appropriate reasons from their three things in the statistical enquiry cycle. Maximum 4 marks if only one aspect (from Collecting data, Processing and presenting, Interpreting and Evaluating) is referenced.</p> <p>B1 for e.g. use amount of time measured to the nearest minute <b>and</b>            B1 for e.g. this is sufficient as there will be a large range of times</p> <p>B1 for e.g. collect data for 23 boys and 23 girls <b>and</b>            B1 for e.g. this will make the calculation of quartiles easier</p> <p>B1 for e.g. use random sampling <b>and</b>            B1 for e.g. this reduces bias as Gary's friends/class/peers may generally watch the same programs</p> <p>B1 for e.g. use primary data <b>and</b>            B1 for e.g. this increases reliability as Gary will know how the data was collected</p> <p>B1 for e.g. A student (Gary) should collect the data <b>and</b>            B1 for e.g. students are more likely to give an honest answer to a fellow student (less threatening)</p> <p>B1 for e.g. use a grouped frequencies table for the data <b>and</b>            B1 for e.g. as this will enable a quick way of estimating the mean or this can be used to draw a histogram</p>	(6)

Question number	Answer	Additional guidance	Mark
14 <i>continued</i>	<p>B1 for planning to generate diagrams and/or visualisations to represent the data <b>and</b> B1 for an appropriate reason</p> <p>OR</p> <p>B1 for planning to generate statistical measures to compare data <b>and</b> B1 for an appropriate reason</p> <p><b>Interpreting</b></p> <p>B1 for planning to interpret diagrams and/or calculations/measures <b>and</b> B1 for an appropriate reason</p> <p>OR</p> <p>B1 for planning to make an inference and/or prediction <b>and</b> B1 for an appropriate reason</p> <p><b>Evaluating</b></p> <p>B1 for planning to identify weaknesses in approach or representation <b>and</b> B1 for an appropriate reason</p> <p>OR</p> <p>B1 for planning to refine the processes to elicit further clarification of the hypothesis <b>and</b> B1 for an appropriate reason</p>	<p>B1 for e.g. use box plots <b>and</b> B1 for e.g. these will enable the comparison of both the medians and the IQRs (i.e. the distributions) of the data</p> <p>B1 for e.g. interpret results for each individual school year <b>and</b> B1 for e.g. as different years could have different watching habits</p> <p>B1 for e.g. by comparing means <b>and</b> B1 for e.g. you can see whether the amount of time that boys spend watching TV is greater, in general, than the amount of time that girls spend watching TV</p> <p>B1 for e.g. use the results from the school to predict the results nationally <b>and</b> B1 for e.g. as students in different parts of the country are likely to have the same watching habits</p> <p>B1 for e.g. choose not to display the information in histograms <b>and</b> B1 for e.g. as “the target audience” may not know how to interpret them</p> <p>B1 for e.g. consider using more than one type of visual representation (for the same information) <b>and</b> B1 for e.g. as different representations focus on different aspects of the data</p>	

Question number	Answer	Additional guidance	Mark
15	<p>B1 for one correct comment for <b>each</b> way e.g.  Way 1: Shows exact values.  Way 2: Shows values/differences clearly or has visual impact.  Way 3: Shows proportions clearly or has visual impact.</p>	<p>B1 for <b>each</b> correct comment assessing the appropriateness of the ways of representing the results</p> <p>A mark for 'visual impact' can only be awarded once, either as the alternative for Way 2 or as the alternative for Way 3.</p>	(3)