Mark Scheme (Results)
Summer 2013

GCSE Statistics
5ST1F_01 (Foundation)

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## NOTES ON MARKI NG PRI NCI PLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear
Comprehension and meaning is clear by using correct notation and labeling conventions.
ii) select and use a form and style of writing appropriate to purpose and to complex subject matter
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
iii) organise information clearly and coherently, using specialist vocabulary when appropriate.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

## 7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses $A$ (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

## 8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

## 9 I gnoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

## 10 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

## 11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

## 12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

## 13 Range of answers

Unless otherwise stated, when an answer is given as a range, e.g [3.5-4.2] then this is inclusive of the end points and includes all numbers within the range.

## Guidance on the use of codes within this mark scheme

```
M1 - method mark
A1 - accuracy mark (dependent on method mark)
B1 - working mark
C1 - communication mark
QWC - quality of written communication
awrt - answer which rounds to
oe - or equivalent
cao - correct answer only
ft - follow through
sc - special case
dep - dependent (on a previous mark or conclusion)
indep - independent
isw - ignore subsequent working
```



| 2. (a) | France | B1 | (1) |
| ---: | :--- | :--- | ---: |
| (b) | Japan | B1 | (1) |
| (c) | (The \%) has gone up (except in France) or It has risen. oe | (1) |  |
| [3] |  |  |  |$|$


| 3. (a) | A: Unlikely | B1 |
| :---: | :---: | :---: |
|  | B: Evens | B1 |
|  | C: Likely | B1 |
| (b) | $\mathbf{X}$ nearer to 0 than 0.5 , but not at 0 | B1 (3) |
|  | X nearer to 0 han 0.5, bat notat | B1 (1) |
| (c) | $\mathbf{X}$ at 0.5 | B1 (1) |
|  |  | (1) |
| (d) | X to right of 0.5 but nearer to 0.5 than 1 | B1 |
|  |  | (1) [6] |
|  | Notes |  |
| (a) | allow 'even' for evens |  |
| (b)(c)(d) | Condone labelling with $\mathrm{A}, \mathrm{B}, \mathrm{C}$ instead of X . More than one X in each scores B0 |  |


| Question | 5ST1F_01 Mark Scheme | Marks |
| :---: | :---: | :---: |
| 4. (a) | 7 12 $\mathbf{1 9}$ all four entries correct <br> 5 6 $\mathbf{1 1}$ (OR at least two correct scores B1) <br> $\mathbf{1 2}$ $\mathbf{1 8}$ 30  | $\begin{aligned} \text { B2 } & \\ & \\ & \\ & \text { (2) }\end{aligned}$ |
| (b)(i) | $\frac{7}{30}$ (accept awrt $23 \%$ or awrt 0.23 ) | B1 |
| (b)(ii) | $\frac{11}{30}$ (accept awrt $37 \%$ or awrt 0.37 ) - follow through their 11 from table | B1 ft <br> (2) <br> [4] |
|  | Notes |  |
| (b) | For probabilities allow truncated to 2 decimal places or awrt 2 decimal places |  |


| 5. (a) <br> (b) | $\frac{5}{6}$ for first dice, not a six <br> $\frac{5}{6}, \frac{1}{6}, \frac{5}{6}$ for second dice outcomes in correct order <br> Yes she is right (oe) as chance of getting two sixes is 1 in 36 or $\frac{1}{6} \times \frac{1}{6}$ or $\frac{1}{36}$ or $0.02(777 \ldots$.. ), o.e. (allow 0.02/0.03) <br> (OR incomplete answer scores B1) | B1 <br> B1 <br> (2) <br> B2 <br> (2) <br> [4] |
| :---: | :---: | :---: |
|  | Notes |  |
| (b) | Calculation may be with tree diagram. <br> B2 requires correct conclusion with a reason referring to both dice, with no contradictory comments, no incorrect answer to $\frac{1}{6} \times \frac{1}{6}$. <br> Other acceptable reasons (not exhaustive): <br> e.g. 'only $1 / 6$ chance on each dice', or 'there are five other numbers on each dice'. <br> If B2 not scored then allow B1 for <br> EITHER: <br> - Correct reason (or working) with no conclusion/wrong conclusion, OR: <br> - Correct conclusion with partially correct reason, e.g.: <br> o with incorrect answer to $\frac{1}{6} \times \frac{1}{6}$ <br> o with reference to only one dice being unlikely (condone 'less than even chance of a six') <br> o condone 'only $1 / 6$ (or $2 / 12$ ) chance of 2 sixes' <br> NB: reference to adding fractions scores $0 / 2$ |  |


| Question | 5ST1F_01 Mark Scheme | Marks |
| :---: | :---: | :---: |
| 6. (a) | Somerfield | B1 |
|  |  | (1) |
| (b) | 1890000 (allow 1890 ) | B1 |
| (c) | $\text { 2009: } 30.1+17.2+16.2+11.7=\quad 2010: 30.4+17.0+16.3+12.3=$ | (1) |
|  | 75.2 76 | A1 A1 |
|  |  | (3) |
| (d) | A correct comment (follow through their figures) | B1ft |
|  |  | (1) |
|  |  | [6] |
|  | Notes |  |
| (c) | M1 for 4 figures added together with at least three correct for either year (may be implied by one correct total). <br> Do not isw here. If there is division by 4 (or 100), then M0 <br> A1 for 75.2 or 76 (allow 76.0) <br> A1 for both answers correct and associated with correct year |  |
| (d) | B1ft for a correct comment based on two values found in (c). (Ignore figures in their statement). <br> Do NOT allow comments about individual supermarkets only. <br> Accept: both about $3 / 4$ / they are similar / there is little change / it has increased etc. |  |


| 7. (a) | 5 at end of the second line and 1 on the fourth line. Both required, no extras. | B1 | (1) |
| :---: | :---: | :---: | :---: |
| (b) | 3 (allow 03 or 3 beetles) | B1 ft | (1) |
| (c) |  | B1 ft | (1) |
| (d) | $\left(\frac{121}{11}=\right)$ attempt to add the numbers and divide by 11 (implied by correct answer) 11 | M1 A1 |  |
|  |  |  | (2) |
| (e) | The mean or ' 11 ' (ie their answer to (d)) It takes into account all the values, oe | B1 B1dep |  |
|  |  |  | [7] |
|  | Notes |  |  |
| (b) | May be a follow through if they have added many leaves to the stem plot |  |  |
| (c) | If nothing is added to the given stem plot then median of 6 is B1ft |  |  |
| (d) | Must attempt sum of numbers, not just leaves, and divide by 11 for M1 <br> SPECIAL CASE: <br> for $\frac{75}{9}$ or 8.3... award M1A0 as misread (using only the original 9 results) |  |  |
|  |  |  |  |
| (e) | If more than one average is mentioned, their choice of average must be clear to award the $1^{\text {st }}$ B1 <br> $2^{\text {nd }} \mathrm{B} 1$ is dependent upon scoring the $1^{\text {st }} \mathrm{B} 1$ <br> Do not accept 'more accurate' for reason. But more representative is B1. <br> SC: Median (or their ' 12 ') with a sensible reason scores B1B0 (eg half the days had more \& half less, or not affected by extreme values) |  |  |
|  |  |  |  |
|  |  |  |  |





| Question | 5ST1F_01 Mark Scheme | Marks |
| :---: | :---: | :---: |
| 11. (a) | Advantage: <br> - People can give a more considered response/feel less pressured / take their time <br> - Avoids possible interviewer bias / ensures all get questions asked the same way <br> - Cheaper/no need to pay interviewers <br> - Faster way to collect lots of data <br> Disadvantage: <br> - Questions cannot be explained if not understood <br> - May have many non-responses | B1 |
| (b) | One reason from each of: <br> - Biased/leading question or says "do you agree..." <br> - Open question (allows for too many different answers) or no response boxes | $\begin{aligned} & \mathrm{B} 1 \\ & \mathrm{~B} 1 \end{aligned}$ <br> (2) |
| (c) | e.g. How much would you be willing to pay to park at the theatre (per visit)? Set of unique boxes - must include units | $\begin{array}{\|l\|} \hline \text { B1 } \\ \text { B1 } \end{array}$ |
| (d) | Any two of: <br> - A sample is quicker <br> - A sample is easier <br> - A sample is cheaper to do <br> - A sample is convenient <br> - A sample has less data to handle | (2) <br> B1 B1 <br> (2) |
| (e) | Any two of: <br> - Not a good sample <br> - Sample too small <br> - Not everyone is in telephone directory <br> - Sample not representative <br> - Not everyone has a chance of being asked <br> - Not random/Is biased | B2 <br> (2) [10] |
|  | Notes |  |
| (a) | For part (a), (b), (d) and (e) ignore excess comments if not contradictory. B1 for a suitable advantage. <br> Condone 'quicker'. Condone 'may be more honest' / 'anonymous' B1 for a suitable disadvantage which does not contradict their advantage. Condone 'cannot ask follow up questions'. <br> Do not allow 'cannot expand on answers' |  |
| (b) | B1 for biased or leading or a comment which directly implies biased/leading B1 for open question or equivalent Both marks may be scored in one line |  |
| (c) | B1 for a suitable non-biased question about the cost of parking B1 for at least 3 response boxes. (Must be non-overlapping but need not be exhaustive) but must include units ( $£ / \mathrm{p}$ ) in the question or response boxes. |  |
| (d) | B1 B1 for any two correct statements. Both marks may be scored in one line. Do not allow converse statements about census unless compared with sample. |  |
| (e) | B2 for any two correct statements <br> (B1 for any one correct statement) |  |


| Question | 5ST1F_ 01 Mark Scheme | Marks |
| :---: | :---: | :---: |
| 12* | One mark for each of three aspects: <br> 1. Number all the boys/pupils (from 0 to 159) or put all names on piece of paper, oe <br> 2. EITHER: Generate eight random numbers OR: draw out eight numbers/names from a hat, oe <br> 3. Boys/pupils (with the) drawn (numbers) are selected for sample. | B1 <br> B1 <br> B1 <br> [3] |
|  | Notes |  |
|  | If describing a method other than simple random, then score $0 / 3$ <br> e.g. mention of 'picking every $20^{\text {th }} \mathrm{boy} /$ pupil' is B0B0B0 <br> e.g. 'choosing the same number from each class/group' is B0B0B0 <br> 'words' in brackets not needed. <br> For aspect 1. allow use of a numbered list/numbered register <br> For aspect 3. Accept e.g. Boys drawn represent the school / boys with those numbers are used, etc. <br> NB: ‘eight boys are drawn from a hat' on its own scores B1 for aspect 2 (but without 'names put on paper' etc is B0 for aspect 1, and, without 'are used' etc is B0 for aspect 3 ). |  |



| Question | 5ST1F 01 Mark Scheme | Marks |
| :---: | :---: | :---: |
| 14. (a) | They have gone up by $12 \%$ | $\begin{align*} & \text { B1 } \\ & \text { B1 } \tag{2} \end{align*}$ |
| (b) | $\frac{123}{100} \times 14000\left(\mathrm{OR} \frac{23}{100} \times 14000+14000\right)$ | M1 |
|  | = £17220 | A1cao <br> (2) |
|  |  | [4] |
|  | Notes |  |
| (a) | B1 for gone up/higher/more. Accept was lower in 2000 |  |
|  | B1 for 12\% / 112\% of what it was / £1 680 / now $£ 15680$ |  |
|  | Gone up by $112 \%$ is B1 B0 |  |
| (b) | M1 for a fully correct method A1 cao |  |

## Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: $\pm 5^{\circ}$
Measurements of length: $\pm 5 \mathrm{~mm}$

## PAPER: 5ST1F_01

| Question | Modification | Notes |  |
| :---: | :--- | :--- | :--- |
| Q2 | Bar chart: 2008 changed to stripes, 2009 changed to dotty. <br> They are 1.5cm bars with 1.5cm spacing. <br> Grid y axis is 1.5 cm for 5. <br> Bars changed: <br> 2008 2009 <br> GB 40 60 <br> France 45 45 <br> Germany 35 55 <br> US 45 55 <br> Japan 15 65 | Standard mark scheme |  |
| Q3 |  | The Probability scales measure 16cm | Standard mark scheme |
| Q5 | (a) | Wording added "There are four spaces to fill." | Standard mark scheme |
| Q6 |  | Iceland, Aldi and Farm Foods removed from table. | Standard mark scheme |
| Q8 |  | Grid is 2cm. Crosses changed to filled in circles. | Standard mark scheme |
| Q9 |  | Grid is 2cm. | Standard mark scheme |

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