

**Mathematics in Education and Industry**

50 years at the forefront of Mathematics Education

**MEI** Innovators in Mathematics Education Mathematics in Education and Industry

### Ideas for teaching statistics at KS4

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This session will look at a selection of approaches for the teaching of statistics within GCSE mathematics. It will include resources which can be taken away and used in the classroom.

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### What's this all about?

Data cross-tabulated by duration and nationality

Duration (d = no of days)	Country 1			Country 2			All other countries		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
500 < d ≤ 750	7	0	7	0	0	0	0	0	0
400 < d ≤ 500	3	0	3	0	0	0	0	0	0
300 < d ≤ 400	11	0	11	0	0	0	1	0	1
200 < d ≤ 300	10	0	10	1	2	3	1	0	1
100 < d ≤ 200	13	1	14	6	2	8	1	0	1
50 < d ≤ 100	5	0	5	15	3	18	0	0	0
10 < d ≤ 50	18	1	19	149	18	167	20	2	22
1 < d ≤ 10	23	1	24	56	3	59	30	3	33
0 < d ≤ 1	1	0	1	4	1	5	0	0	0
<b>Total</b>	<b>91</b>	<b>3</b>	<b>94</b>	<b>231</b>	<b>29</b>	<b>260</b>	<b>53</b>	<b>5</b>	<b>58</b>

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### The Future of Statistics in our schools and colleges

Roger Porkess, Royal Statistical Society.

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### The Future of Statistics in our schools and colleges

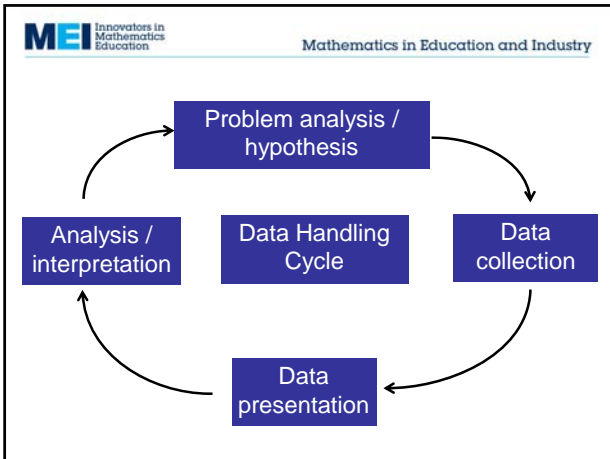
Roger Porkess, Royal Statistical Society.

Recommendation 13: The new National Curriculum should ensure not only that students meet a suitable statistics curriculum at all ages up to 16 but also that it prepares them for a future in which many of them will be using statistics in a wide variety of contexts throughout the rest of their lives.

Recommendation 14: The programme of study for Key Stage 2 should include the data handling cycle, as is currently the case for Key Stages 3 and 4.

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### Standards Unit: Improving Teaching & Learning in mathematics. S5 and S6



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### Multiple representations

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### What's this all about?

**Data Cross-Tabulated By Economic Status and Gender**

Economic Status	Population Exposed to Incident			Number of Deaths			Deaths Per 100 Exposed to Incident		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
I (high)	180	145	325	118	4	122	65	3	37
II	179	106	285	154	13	167	87	12	59
III (low)	510	196	706	422	106	528	83	54	73
Other	862	23	885	670	3	673	78	13	76
Total	1731	470	2201	1364	126	1490	80	27	67

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**Data Cross-Tabulated by Economic Status and Age**

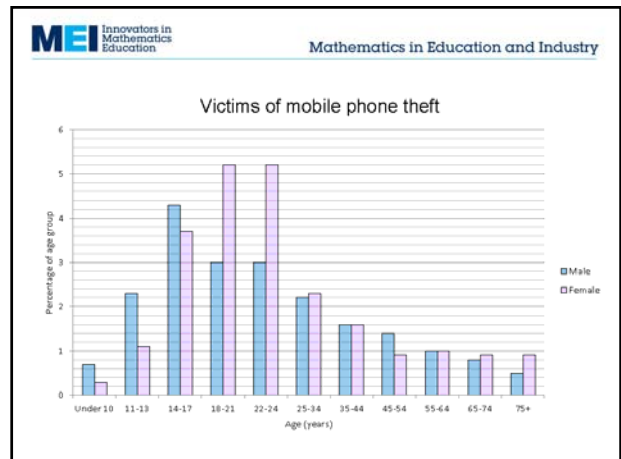
Economic Status	Population Exposed to Incident			Number of Deaths			Deaths per 100 Exposed to Incident		
	Adult	Child	Both	Adult	Child	Both	Adult	Child	Both
I (high)	319	6	325	122	0	122	38	0	37
II	261	24	285	167	0	167	64	0	59
III (low)	627	79	706	476	52	528	76	66	73
Other	885	0	885	673	0	673	76	-	76
Total	2092	109	2201	1438	52	1490	69	48	67

<http://exploringdata.net/unusual.htm>  
 Source: Dawson, J. MacG, 1995, *The "Unusual Episode" Data Revisited*, Journal of Statistics Education v.3, n.3

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### Baby weight data

<http://www.tsm-resources.com/useful-files.html>



## Stem and leaf multiple representations

### Suggestions for use

This activity is taken from the Teaching GCSE Mathematics (TGM) sustained professional development course, [www.mei.org.uk/tgm](http://www.mei.org.uk/tgm).

We suggest that not all of the cards are given to students at once.

## Raw Data cards

<p>Raw data needed</p>	<p>2 4 8 13 15 25 26 38 32 32</p>
<p>4 10 12 25 28 29 30 33 36 37</p>	<p>12 14 14 21 25 28 31 32 38 42 45 45</p>
<p>Raw data needed</p>	<p>2 2 4 11 16 18 23 23 23 32 34 35</p>
<p>2 4 4 11 15 18 23 23 23 32 35 35</p>	<p>3 5 17 18 18 20 25 28 34 38</p>

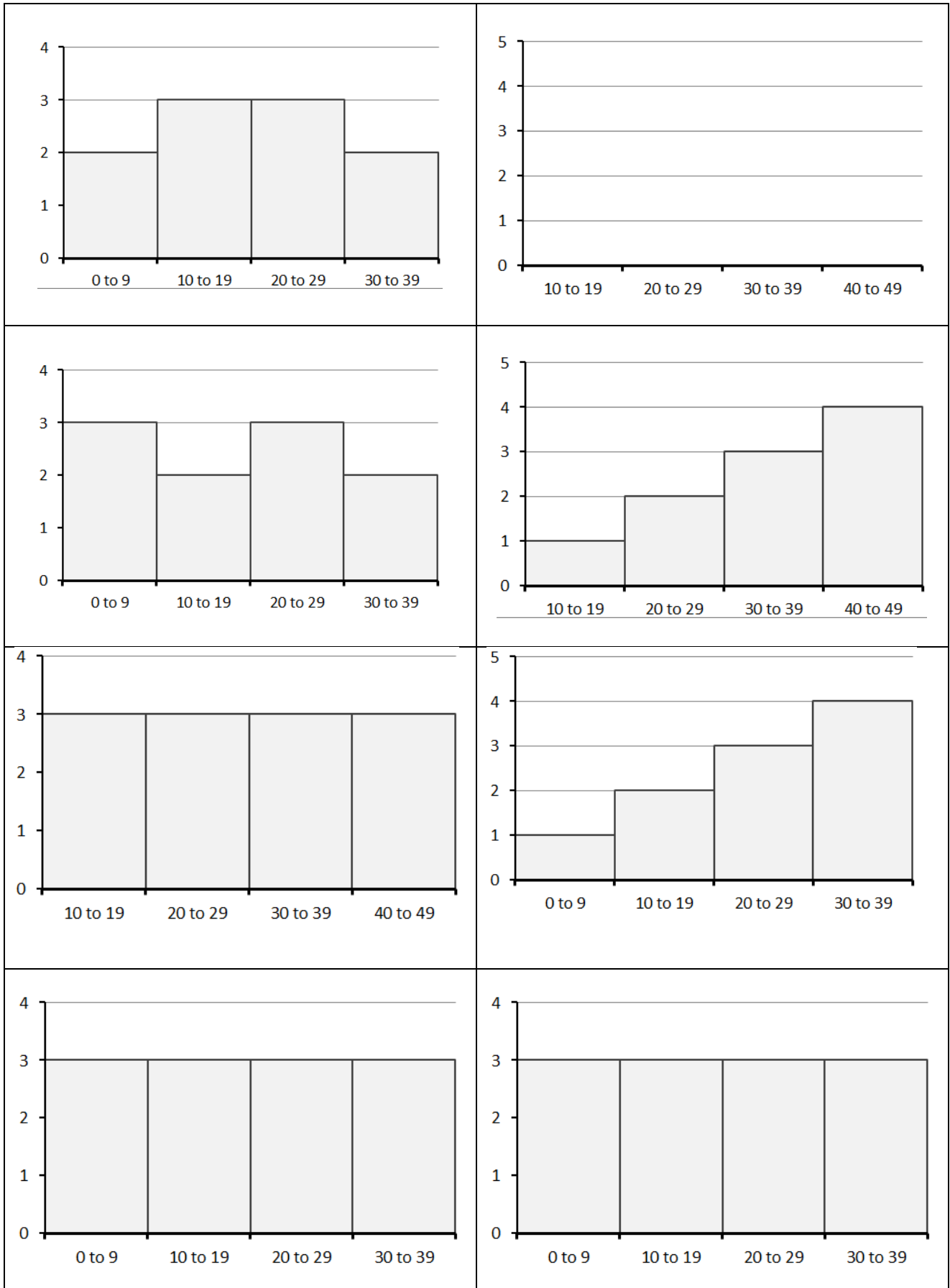
### Stem and leaf cards

<p>Key 2   3 = 23</p> <pre> 0   2 2 4 1   1 6 8 2   3 3 3 3   2 4 5 4   5                       </pre>	<p>Key 2   4 = 24</p> <pre> 0   1   2 2 4 8 2   4 6 7 3   2 4 4   5 5                       </pre>
<p>Key 2   3 = 23</p> <pre> 0   2 4 4 1   1 5 8 2   3 3 3 3   2 5 5 4   5                       </pre>	<p>Key</p> <pre> 0   1   2   3   4   5                       </pre>
<p>Key 2   1 = 21</p> <pre> 0   1   2 4 4 2   1 5 8 3   3 3 3 4   2 5 5 5                       </pre>	<p>Key 2   5 = 25</p> <pre> 0   4 1   0 2 2   5 8 9 3   0 3 6 7 4   5                       </pre>
<p>Key 1   2 = 12</p> <pre> 0   1   2 2   2 7 3   0 0 1 4   2 5 5 5 5                       </pre>	<p>Key 2   5 = 25</p> <pre> 0   2 4 8 1   3 5 2   5 6 8 3   2 2 4   5                       </pre>

### Statistics cards

<p>Mode: ? Median: ? Mean: ?</p> <p>Minimum: ? Lower quartile: ? Upper quartile: ? Maximum: ? Range: ?</p>	<p>Mode: 45 Median: 30.5 Mean: 18.8 (1dp)</p> <p>Minimum: 12 Lower quartile: 17.5 Upper quartile: 37.5 Maximum: 45 Range: 33</p>
<p>Mode: 32 Median: 20 Mean: 18.5</p> <p>Minimum: ? Lower quartile: ? Upper quartile: ? Maximum: ? Range: ?</p>	<p>Mode: None Median: 28.5 Mean: 24.4 (1dp)</p> <p>Minimum: 4 Lower quartile: 12 Upper quartile: 33 Maximum: 37 Range: 33</p>
<p>Mode: 23 Median: 20.5 Mean: 18.8 (1dp)</p> <p>Minimum: 2 Lower quartile: 7.5 Upper quartile: 27.5 Maximum: 35 Range: 33</p>	<p>Mode: 12 Median: 25 Mean: 24.3 (1dp)</p> <p>Minimum: 12 Lower quartile: 14 Upper quartile: 32 Maximum: 45 Range: 33</p>
<p>Mode: 45 Median: 30.5 Mean: 32.9 (1dp)</p> <p>Minimum: 12 Lower quartile: 27 Upper quartile: 45 Maximum: 45 Range: 33</p>	<p>Mode: 23 Median: 20.5 Mean: 18.6 (1dp)</p> <p>Minimum: 2 Lower quartile: 7.5 Upper quartile: 27.5 Maximum: 35 Range: 33</p>

## Bar graph cards



# Box plots

