

KS3 Unit 14 Averages

Topic/Skill	Definition/Tips	Example																				
1. Mean	Add up the values and divide by how many values there are.	The mean of 3, 4, 7, 6, 0, 4, 6 is $\frac{3 + 4 + 7 + 6 + 0 + 4 + 6}{7} = 5$																				
2. Mean from a Table	<ol style="list-style-type: none"> 1. Find the midpoints (if necessary) 2. Multiply Frequency by values or midpoints 3. Add up these values 4. Divide this total by the Total Frequency <p>If grouped data is used, the answer will be an estimate.</p>	<table border="1"> <thead> <tr> <th>Height in cm</th> <th>Frequency</th> <th>Midpoint</th> <th>F × M</th> </tr> </thead> <tbody> <tr> <td>$0 < h \leq 10$</td> <td>8</td> <td>5</td> <td>$8 \times 5 = 40$</td> </tr> <tr> <td>$10 < h \leq 30$</td> <td>10</td> <td>20</td> <td>$10 \times 20 = 200$</td> </tr> <tr> <td>$30 < h \leq 40$</td> <td>6</td> <td>35</td> <td>$6 \times 35 = 210$</td> </tr> <tr> <td>Total</td> <td>24</td> <td>Ignore!</td> <td>450</td> </tr> </tbody> </table> <p>Estimated Mean height: $450 \div 24 = 18.75\text{cm}$</p>	Height in cm	Frequency	Midpoint	F × M	$0 < h \leq 10$	8	5	$8 \times 5 = 40$	$10 < h \leq 30$	10	20	$10 \times 20 = 200$	$30 < h \leq 40$	6	35	$6 \times 35 = 210$	Total	24	Ignore!	450
Height in cm	Frequency	Midpoint	F × M																			
$0 < h \leq 10$	8	5	$8 \times 5 = 40$																			
$10 < h \leq 30$	10	20	$10 \times 20 = 200$																			
$30 < h \leq 40$	6	35	$6 \times 35 = 210$																			
Total	24	Ignore!	450																			
3. Median Value	<p>The middle value.</p> <p>Put the data in order and find the middle one.</p> <p>If there are two middle values, find the number half way between them by adding them together and dividing by 2.</p>	<p>Find the median of: 4, 5, 2, 3, 6, 7, 6</p> <p>Ordered: 2, 3, 4, 5, 6, 6, 7</p> <p>Median = 5</p>																				
4. Median from a Table	<p>Use the formula $\frac{(n+1)}{2}$ to find the position of the median.</p> <p>n is the total frequency.</p>	<p>If the total frequency is 15, the median will be the $\left(\frac{15+1}{2}\right) = 8\text{th}$ position</p>																				
5. Mode /Modal Value	<p>Most frequent/common.</p> <p>Can have more than one mode (called bi-modal or multi-modal) or no mode (if all values appear once)</p>	<p>Find the mode: 4, 5, 2, 3, 6, 4, 7, 8, 4</p> <p>Mode = 4</p>																				
6. Range	<p>Highest value subtract the Smallest value</p> <p>Range is a 'measure of spread'. The smaller the range the more <u>consistent</u> the data.</p>	<p>Find the range: 3, 31, 26, 102, 37, 97.</p> <p>Range = $102 - 3 = 99$</p>																				
7. Lower Quartile	<p>Divides the bottom half of the data into two halves.</p> <p>$LQ = Q_1 = \frac{(n+1)}{4} \text{th value}$</p>	<p>Find the lower quartile of: 2, 3, 4, 5, 6, 6, 7</p> <p>$Q_1 = \frac{(7+1)}{4} = 2\text{nd value} \rightarrow 3$</p>																				
8. Upper Quartile	<p>Divides the top half of the data into two halves.</p> <p>$UQ = Q_3 = \frac{3(n+1)}{4} \text{th value}$</p>	<p>Find the upper quartile of: 2, 3, 4, 5, 6, 6, 7</p> <p>$Q_3 = \frac{3(7+1)}{4} = 6\text{th value} \rightarrow 6$</p>																				
9. Interquartile Range	<p>The difference between the upper quartile and lower quartile.</p> <p>$IQR = Q_3 - Q_1$</p> <p>The smaller the interquartile range, the more consistent the data.</p>	<p>Find the IQR of: 2, 3, 4, 5, 6, 6, 7</p> <p>$IQR = Q_3 - Q_1 = 6 - 3 = 3$</p>																				