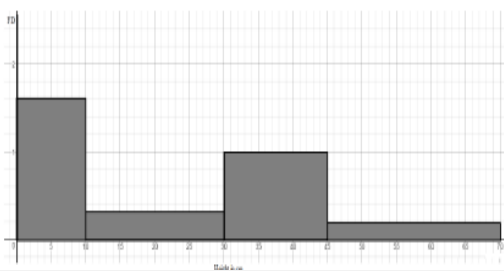
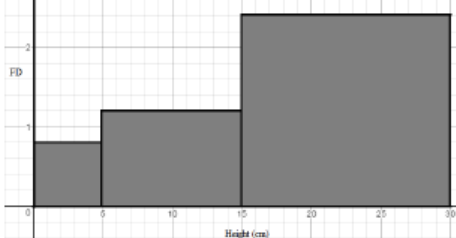
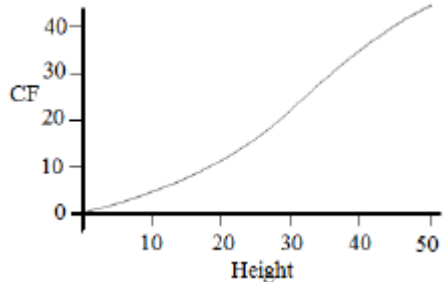
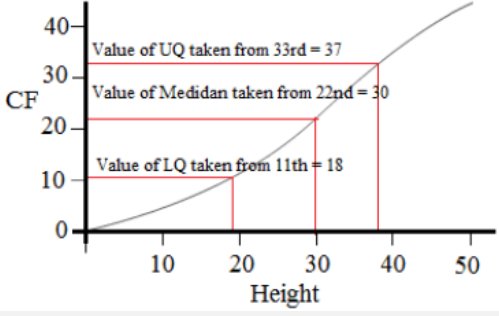


Topic: Histograms and Cumulative Frequency

Topic/Skill	Definition/Tips	Example										
1. Histograms	<p>A visual way to display frequency data using bars.</p> <p>Bars can be unequal in width.</p> <p>Histograms show frequency density on the y-axis, not frequency.</p> $\text{Frequency Density} = \frac{\text{Frequency}}{\text{Class Width}}$ <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Height(cm)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < h \leq 10$</td> <td>8</td> </tr> <tr> <td>$10 < h \leq 30$</td> <td>6</td> </tr> <tr> <td>$30 < h \leq 45$</td> <td>15</td> </tr> <tr> <td>$45 < h \leq 70$</td> <td>5</td> </tr> </tbody> </table>	Height(cm)	Frequency	$0 < h \leq 10$	8	$10 < h \leq 30$	6	$30 < h \leq 45$	15	$45 < h \leq 70$	5	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">Frequency Density (FD)</p> <p style="text-align: center;">$8 \div 5 = 1.6$</p> <p style="text-align: center;">$6 \div 20 = 0.3$</p> <p style="text-align: center;">$15 \div 15 = 1$</p> <p style="text-align: center;">$5 \div 25 = 0.2$</p> </div> 
Height(cm)	Frequency											
$0 < h \leq 10$	8											
$10 < h \leq 30$	6											
$30 < h \leq 45$	15											
$45 < h \leq 70$	5											
2. Interpreting Histograms	<p>The area of the bar is proportional to the frequency of that class interval.</p> $\text{Frequency} = \text{Freq Density} \times \text{Class Width}$	<p>A histogram shows information about the heights of a number of plants. 4 plants were less than 5cm tall. Find the number of plants more than 5cm tall.</p>  <p>Above 5cm: $1.2 \times 10 + 2.4 \times 15 = 12 + 36 = 48$</p>										
3. Cumulative Frequency	<p>Cumulative Frequency is a running total.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Age</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < a \leq 10$</td> <td>15</td> </tr> <tr> <td>$10 < a \leq 40$</td> <td>35</td> </tr> <tr> <td>$40 < a \leq 50$</td> <td>10</td> </tr> </tbody> </table>	Age	Frequency	$0 < a \leq 10$	15	$10 < a \leq 40$	35	$40 < a \leq 50$	10	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">Cumulative Frequency</p> <p style="text-align: center;">15</p> <p style="text-align: center;">$15 + 35 = 50$</p> <p style="text-align: center;">$50 + 10 = 60$</p> </div>		
Age	Frequency											
$0 < a \leq 10$	15											
$10 < a \leq 40$	35											
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4. Cumulative Frequency Diagram	<p>A cumulative frequency diagram is a curve that goes up. It looks a little like a stretched-out S shape.</p> <p>Plot the cumulative frequencies at the end-point of each interval.</p>											

<p>5. Quartiles from Cumulative Frequency Diagram</p>	<p>Lower Quartile (Q1): 25% of the data is less than the lower quartile. Median (Q2): 50% of the data is less than the median. Upper Quartile (Q3): 75% of the data is less than the upper quartile. Interquartile Range (IQR): represents the middle 50% of the data.</p>	 <p style="text-align: center;">$IQR = 37 - 18 = 19$</p>
<p>6. Hypothesis</p>	<p>A statement that might be true, which can be tested.</p>	<p>Hypothesis: 'Large dogs are better at catching tennis balls than small dogs'.</p> <p>We can test this hypothesis by having hundreds of different sized dogs try to catch tennis balls.</p>