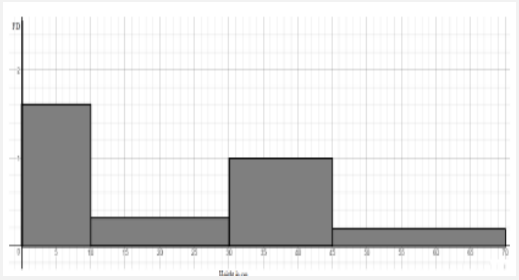
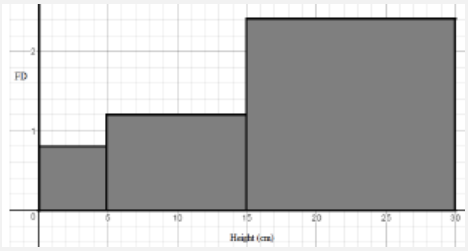
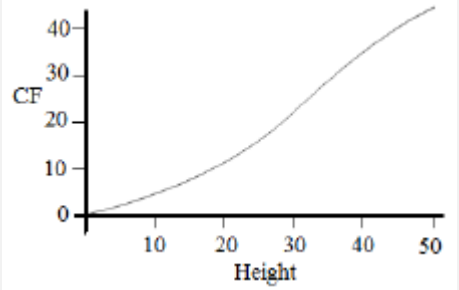
STM Knowledge Organiser Year: 10 Subject: Maths

Core Knowledge

Topic: Histograms and Cumulative Frequency

Topic/Skill	Definition/Tips	Example
1. Histograms	A visual way to display frequency data using bars. Bars can be **unequal in width**. Histograms show **frequency density** on the **y-axis**, not frequency. $$\textbf{Frequency Density} = \frac{\textbf{Frequency}}{\textbf{Class Width}}$$ | Height(cm) | Frequency | | $0 < h \leq 10$ | 8 | | $10 < h \leq 30$ | 6 | | $30 < h \leq 45$ | 15 | | $45 < h \leq 70$ | 5 |	| Frequency Density (FD) | | $8 \div 5 = 1.6$ | | $6 \div 20 = 0.3$ | | $15 \div 15 = 1$ | | $5 \div 25 = 0.2$ | 
2. Interpreting Histograms	The **area** of the bar is proportional to the **frequency** of that class interval. $$\textbf{Frequency} = \textbf{Freq Density} \times \textbf{Class Width}$$	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.  Above 5cm: 1.2 x 10 + 2.4 x 15 = 12 + 36 = 48
3. Cumulative Frequency	Cumulative Frequency is a **running total**. | Age | Frequency | | $0 < a \leq 10$ | 15 | | $10 < a \leq 40$ | 35 | | $40 < a \leq 50$ | 10 |	| Cumulative Frequency | | 15 | | $15 + 35 = 50$ | | $50 + 10 = 60$ |
4. Cumulative Frequency Diagram	A cumulative frequency diagram is a **curve that goes up**. It looks a little like a stretched-out **S shape**. Plot the cumulative frequencies at the **end-point** of each interval.	

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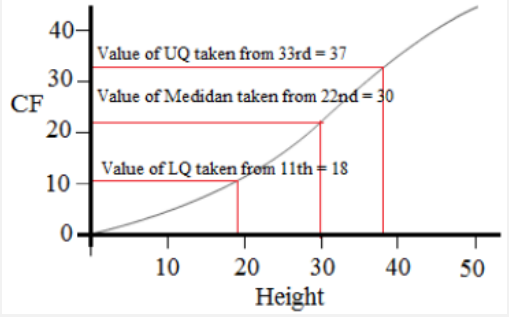
5. Quartiles from Cumulative Frequency Diagram	**Lower Quartile** (Q1): **25%** of the data is less than the lower quartile. **Median** (Q2): **50%** of the data is less than the median. **Upper Quartile** (Q3): **75%** of the data is less than the upper quartile. **Interquartile Range (IQR)**: represents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

Links to finding averages, interpret and compare information from different diagrams