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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Histograms and Cumulative Frequency**  |
| 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.$$Frequency Density= \frac{Frequency}{Class Width}$$ |  |
| 2. Interpreting Histograms | The **area** of the bar is proportional to the **frequency** of that class interval.$$Frequency=Freq Density ×Class Width$$ | 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**. |  |
| 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. |  |
| 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. |

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| 7. Box Plots | The minimum, lower quartile, median, upper quartile and maximum are shown on a box plot.A box plot can be drawn independently or from a cumulative frequency diagram. | Students sit a maths test. The highest score is 19, the lowest score is 8, the median is 14, the lower quartile is 10 and the upper quartile is 17. Draw a box plot to represent this information. |
| 8. Comparing Box Plots | Write two sentences.1. Compare the **averages** using the **medians** for two sets of data.2. Compare the **spread** of the data using the **range or IQR** for two sets of data.The smaller the range/IQR, the more consistent the data.You must compare box plots **in the context of the problem**. | ‘On average, students in class A were more successful on the test than class B because their median score was higher.’‘Students in class B were more consistent than class A in their test scores as their IQR was smaller.’ |
| 9. Lower Quartile | **Divides** the **bottom half** of the data into **two halves**.**LQ =** $Q\_{1}=\frac{(n+1)}{4}th $**value** | Find the lower quartile of: 2, **3**, 4, 5, 6, 6, 7$Q\_{1}=\frac{(7+1)}{4}=2nd $value 🡪 3 |
| 10. Lower Quartile | **Divides** the **top half** of the data into **two halves**.**UQ =** $Q\_{3}=\frac{3(n+1)}{4}th $**value** | Find the upper quartile of: 2, 3, 4, 5, 6, **6**, 7$Q\_{3}=\frac{3(7+1)}{4}=6th $value 🡪 6 |
| 11. Interquartile Range | The **difference** between the **upper quartile and lower quartile.**$$IQR=Q\_{3}-Q\_{1}$$The **smaller** the **interquartile range**, the **more** **consistent** the data. | Find the IQR of: 2, 3, 4, 5, 6, 6, 7$$IQR=Q\_{3}-Q\_{1}=6-3=3$$ |

**Knowledge Organiser**