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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Representing Data**  |
| 1. Frequency Table | A record of **how often each value** in a set of data **occurs**. | Image result for math definition frequency table |
| 2. Bar Chart | Represents data as vertical blocks.$x-axis$ shows the **type** of data$y-axis$ shows the **frequency** for each type of dataEach bar should be the **same width**There should be **gaps** between each barRemember to **label** each axis. | Image result for gcse bar charts |
| 3. Types of Bar Chart | **Compound/Composite** Bar Charts show data stacked on top of each other.**Comparative/Dual** Bar Charts show data side by side. | Image result for compound bar chartsImage result for comparative bar charts |
| 4. Pie Chart | Used for showing **how data breaks down** **into** its constituent **parts**.When drawing a pie chart, **divide 360° by the total frequency**. This will tell you how many degrees to use for the frequency of each category.Remember to **label** the category that each sector in the pie chart represents. | Image result for pie chart gcseIf there are 40 people in a survey, then each person will be worth 360÷40=9° of the pie chart. |
| 5. Pictogram | Uses **pictures** or symbols to **show the value** of the data.A pictogram must have a **key**. |  |
| 6. Line Graph | A graph that uses **points connected by straight lines** to show how data changes in values.This can be used for **time series data**, which is a series of data points spaced over uniform time intervals in **time order**. | Line Graph |
| 7. Two Way Tables | A table that **organises data** around **two categories.**Fill out the information step by step using the information given.Make sure all the totals add up for all columns and rows. |  |

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| **Topic/Skill**  | **Definition/Tips****Topic: Scatter Graphs**  | **Example** |
| 1. Correlation | Correlation between two sets of data means they are **connected** in some way. | There is correlation between temperature and the number of ice creams sold. |
| 2. Causality | When one variable **influences** another variable. | The more hours you work at a particular job (paid hourly), the higher your income from that job will be. |
| 3. Positive Correlation | As one value **increases** the other value **increases**. |  |
| 4. Negative Correlation | As one value **increases** the other value **decreases**. |  |
| 5. No Correlation | There is **no linear relationship** between the two. |  |
| 6. Strong Correlation | When two sets of data are **closely linked**. | Image result for strong weak correlation definition math |
| 7. Weak Correlation | When two sets of data have correlation, but are **not closely linked**. | Image result for strong weak correlation definition math |
| 8. Scatter Graph | A graph in which values of **two variables** are plotted along two axes to **compare** them and see if there is any **connection** between them. | Image result for scatter diagram |
| 9. Line of Best Fit | A **straight line** that **best represents the data** on a scatter graph. | Image result |
| 10. Outlier | A value that ‘lies outside’ most of the other values in a set of data.An outlier is **much smaller or much larger** than the other values in a set of data. | Image result for outlier maths |

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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Systematic Listing**  |
| 1. Combination | A collection of things, where the **order does not matter**. | How many combinations of two ingredients can you make with apple, banana and cherry?Apple, BananaApple, CherryBanana, Cherry3 combinations |
| 2. Permutation | A collection of things, where the **order does matter**. | You want to visit the homes of three friends, Alex (A), Betty (B) and Chandra (C) but haven’t decided the order. What choices do you have?ABCACBBACBCACABCBA |
| 3. Permutations with Repetition | When something has $n$ different types, there are $n$ **choices each time**.Choosing $r$ of something that has $n$ different types, the permutations are:$$n×n×…\left(r times\right)=n^{r}$$ | How many permutations are there for a three-number combination lock?10 numbers to choose from $\{1, 2, ….10\}$ and we choose 3 of them 🡪$10×10×10=10^{3}=1000$ permutations. |
| 4. Permutations without Repetition | We have to **reduce the number of available choices each time**.One you have chosen something, you cannot choose it again. | How many ways can you order 4 numbered balls?$$4×3×2×1=24$$ |
| 5. Factorial | The factorial symbol ‘!’ means to multiply a series of descending integers to 1.Note: $0!=1$ | $$4!=4×3×2×1=24$$ |

**Knowledge Organiser**