

Statistics Revision topic list

[Mathsgenie](#) and [Stats Academy](#) both have some excellent materials to support your GCSE Statistics revision. There are exam questions sorted by topic, videos and lots of past papers.

[Here's a set of revision notes](#) that you might also find useful when reviewing topics but remember that to revise Statistics, you need to do Statistics:

Here is a full list of topics for Statistics:

Unit 1 - The collection of data

- Use correct terminology to describe different types of data and know the differences between them (primary, secondary, quantitative, qualitative, discrete, continuous, categorical, ordinal, bivariate and multivariate)
- Know how to group rounded and unrounded data into class intervals or categories and the advantages and disadvantages of doing so.
- Understand population, census, National Census, sample and sample frame, and identify these for given data.
- **Use the Petersen capture–recapture formula to estimate the size of a population and know the assumptions made when using this method.**
- Know and be able to describe different methods of random and non-random sampling (including judgement, opportunity, cluster, systematic and quota) and understand the advantages / disadvantages of each.
- Select a sample stratified by one category and by more than one category.
- Know the key features to consider when planning interviews and questionnaires.
- Know how and why to clean data including outliers, or anomalous data values.
- Identify and control extraneous variables.
- Know the importance of controlling extraneous variables and **be able to describe and use control groups and matched pairs.**
- Write a hypothesis and decide on suitable data to collect to test it.
- Know the advantages of using a pilot survey.
- Design a data collection sheet, and collect data from different sources.
- **Use the random response method for sensitive questions.**

- Know possible constraints on an investigation and how to deal with difficulties such as non-response.
- Know potential problems with collected data and how to deal with them.
- **Understand and know when to use control groups and matched pairs.**

Unit 2: Processing, representing and analysing data

- Select the appropriate representation to use.
- Decide whether to group data into class intervals.
- Recognise well-presented and poorly presented data.
- Construct, draw, use and understand:
 - two-way tables
 - tally charts
 - pictograms
 - bar charts
 - vertical line graphs
 - stem and leaf diagrams
 - pie charts
 - population pyramids
 - choropleth maps
 - cumulative frequency graphs
 - histograms
 - frequency polygons
 - **comparative pie charts with area proportional to frequency**
 - **histograms with unequal class widths**
- Identify the shape of distributions of data including symmetry, positive and negative skew.

Unit 3: Summarising data: measures of central tendency and dispersion

- Calculate:
 - The mean, mode, median (including by interpolation) and range for a list of numbers and discrete and/or continuous data listed in a table
 - The minimum, lower quartile, median, upper quartile and maximum value for a list of numbers
 - The interquartile range, percentiles and the **interpercentile range** for a set of data.
 - The standard deviation for discrete and grouped data
 - The skewness by inspection **and calculation**
- Understand the advantages and disadvantages of each of the three measures of central tendency, and which is appropriate to use in different situations.
- Understand the effect of transformations on the mean, mode and median.

- **Calculate a geometric mean and weighted mean for a set of data.**
- Construct, use and interpret box plots from summary statistics and cumulative frequency graphs.
- Identify and interpret outliers by both inspection **and calculation** and show on a box plots.
- Use box plots as a method to compare sets of data for dispersion, measures of central tendency and skewness.
- Given the median and interquartile range, make comparisons between different data samples to compare the sample and population data.
- Identify simple properties of the shape of distributions of data including symmetry, positive and negative skew.

Unit 4: Scatter diagrams and correlation

- Draw a scatter diagram
- Know the difference between an explanatory (independent) and response (dependent) variable
- Recognise positive, negative and zero correlation as well as strong, moderate or weak correlation by inspection
- Understand the distinction between correlation and causality
- Draw a line of best fit through the mean point to the points on a scatter diagram and to find the equation of the regression line
- Understand the pitfalls of interpolation and extrapolation
- **Find the equation of a line of best fit**
- **Draw a regression line on a scatter diagram given the equation**
- Interpret the value of the gradient and y-intercept
- Interpret Spearman's rank correlation coefficient
- **Calculate and interpret Spearman's rank correlation coefficient**
- **Understand the difference between Spearman's rank and Pearson's product moment correlation coefficients**
- **Interpret Pearson's product moment correlation coefficient in context**

Unit 5: Time Series

- Draw and interpret line graphs and time series.
- Draw trend lines on time series graphs and use inspection to identify trends.
- Know that a trend line shows the general trend of data.
- Interpret rising, falling and level trends on a time series graph.
- Identify seasonal variation on a time series graph.

- Calculate moving averages and provide reasoning as to appropriateness
- Draw a trend line through moving averages by eye.
- **Calculate and describe the process to calculate the estimated mean seasonal variation.**
- **Know that the predicted value = trend line + mean seasonal variation.**

Unit 6: Probability

- Understand the meaning of the words impossible, certain, very likely, likely, unlikely, possible and evens
- Use fractions, decimals and percentages to represent probabilities
- Experimental probability - use probability values to calculate expected frequencies and compare them with actual frequencies
- Use probability to assess risk and be able to calculate absolute and relative risk
- Use sample space, venn and tree diagrams to represent the different outcomes possible for up to three events
- Understand the terms mutually exclusive and exhaustive
- Use the addition law $P(A \text{ or } B) = P(A) + P(B)$ for two mutually exclusive events
- **Use the general addition law for events that are not mutually exclusive.**
- Understand what it means for two events to be independent
- Use the multiplication laws for independent events
- Use a tree diagram to calculate probabilities
- Understand what it means for two events to be conditional
- Calculate conditional probability using a tree diagram, two-way table or Venn diagram
- Use the formula for conditional probability
- Know that for independent events A and B, $P(A) = P(A|B)$

Unit 7: Index numbers

- Calculate index numbers with use of a base year
- Interpret index numbers, including RPI and CPI
- Interpret GDP value (an economy is in recession if GDP falls in 2 or more successive quarters)
- Calculate rates of change over time including crude birth and death rates

- Calculate standardised birth and death rates
- Calculate and interpret weighted index numbers
- Calculate chain base index numbers

Unit 6: Probability distributions

- Know the conditions for a binomial distribution to be a suitable model
- Understand the notation $B(n,p)$
- Calculate probabilities using a binomial distribution
- Know that the mean of a binomial distribution is np
- Know the conditions for a normal distribution to be a suitable model
- Understand the notation $N(\mu, \sigma^2)$
- Know the shape of a normal distribution and how this occurs (including 1σ 68%, 2σ 95% and 3σ 99.8%)
- Draw normal distribution curves, including 2 curves on the same graph
- Use standardised scores to compare 2 samples of data
- Understand the process of quality assurance and why it is necessary in the real world
- Calculate warning and action limits and represent on a control chart for means, medians and ranges
- Understand how warning and action limits are used in the manufacturing process