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| **Year 1 Statistics Units** | **Road Map** | | | | | |
| In this unit you will learn about statistics. The aims are as follows:  **LG1**: Knowledge  **LG2**: Application  **LG3**: Skills | Assessment Grades |  |  | | | |
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| **Themes** | **Learning Goals/Outcomes/Content** | | |  |  |  |
| **Unit 1: Data presentation and interpretation (part 1)** | be able to calculate measures of location, mean, median and mode; | | |  |  |  |
| be able to calculate measures of variation, standard deviation, variance, range and interpercentile range; | | |  |  |  |
| be able to interpret and draw inferences from summary statistics. | | |  |  |  |
| Understand and use coding | | |  |  |  |
| **Unit 2 : Data presentation and interpretation (part 2)** | know how to draw & interpret diagrams ( box plots, cf diagrams,histograms) for single variable data; | | |  |  |  |
| recognise and interpret possible outliers in data sets and statistical diagrams; | | |  |  |  |
| be able to compare two data sets | | |  |  |  |
| be able to select or critique data presentation techniques in the context of a statistical problem; | | |  |  |  |
| be able to clean data, including dealing with missing data, errors and outliers. | | |  |  |  |
| **Unit 3 : Correlation and Regression Lines** | know how to interpret scatter diagrams and regression lines for bivariate data; | | |  |  |  |
| recognise the explanatory and response variables; | | |  |  |  |
| be able to make predictions using the regression line and understand its limitations; | | |  |  |  |
| understand informal interpretation of correlation; | | |  |  |  |
| understand that correlation does not imply causation; | | |  |  |  |
| recognise and interpret possible outliers in data sets and statistical diagrams; | | |  |  |  |
| be able to select or critique data presentation techniques in the context of a statistical problem; | | |  |  |  |
| be able to clean data, including dealing with missing data, errors and outliers. | | |  |  |  |
| **Unit 4: Probability** | understand and be able to use mutually exclusive and independent events when calculating probabilities; | | |  |  |  |
| be able to make links to discrete and continuous distributions. | | |  |  |  |
| **Unit 5: Statistical Distributions** | understand and be able to use simple, discrete probability distributions, including the binomial distribution; | | |  |  |  |
| be able to identify the discrete uniform distribution; | | |  |  |  |
| be able to calculate probabilities using the binomial distribution. | | |  |  |  |
| **6a. Introduction to sampling terminology; Advantages and disadvantages of sampling** | understand and be able to use the terms ‘population’ and ‘sample’; | | |  |  |  |
| know how to use samples to make informal inferences about the population; | | |  |  |  |
| be able to describe advantages and disadvantages of sampling compared to census. | | |  |  |  |
| **6b. Understand and use sampling techniques; Compare sampling techniques in context** | understand and be able to use sampling techniques; | | |  |  |  |
| be able to describe advantages and disadvantages of sampling techniques; | | |  |  |  |
| be able to select or critique sampling techniques in the context of solving a statistical problem; | | |  |  |  |
| understand that different samples can lead to different conclusions about the population. | | |  |  |  |
| **7a. Language of hypothesis testing; Significance levels** | understand and be able to apply the language of statistical hypothesis testing, developed through a binomial model. | | |  |  |  |
| **7b. Carry out hypothesis tests involving the binomial distribution** | be able to conduct a statistical hypothesis test for the proportion in the binomial distribution and interpret the results in context; | | |  |  |  |
| understand that a sample is being used to make an inference about the population; | | |  |  |  |
| appreciate that the significance level is the probability of incorrectly rejecting the null hypothesis. | | |  |  |  |

**Links:**

LG1: You should know how to interpret measures of central tendency and variation. You should be able to calculate standard deviation. You will learn how to draw a number of statistical diagrams, and identify outliers. You need to know how to interpret scatter diagrams and regression lines. You should recognise correlation and know that it does not imply causation. You should know how to make predictions using a regression line. You will learn how to use simple, discrete probability distributions, including the binomial distribution, to calculate probabilities. You need to know the meanings of the terms population and sample, and know how to use simple sampling techniques. You will learn the language of statistical hypothesis testing, and know how to construct a statistical hypothesis test for the proportion in the binomial distribution.

LG2: You should be able to apply your knowledge of statistics to select or critique data presentation techniques in the context of a statistical problem. You will apply your knowledge of probability to calculate probabilities from events modelled in a number of ways such as venn diagrams or sample space diagrams. You will learn how to apply your knowledge of probability to comment critically on how appropriate a given probability model may be for a situation. You will apply your knowledge of sampling to select or critique sampling techniques in the context of solving a statistical problem. You will apply your knowledge of hypothesis testing to interpret the results of a hypothesis test in context and appreciate that the significance level is the probability of incorrectly rejecting the null hypothesis.

LG3: You should be able to use your statistical skill set to work with the large data set by cleaning data, calculating summary statistics from elements of the data set and then comparing and interpreting those statistics. You will model selections of data from the large data set using the diagrams and techniques in this unit. You will interpret and extrapolate apparent trends while evaluating the reliability of doing so. You will use your probability skills to model a wide variety of real-world scenarios using a number of different distributions and be able to comment fluently on appropriateness of distributions. You will use your statistical skill set to work with a wide variety of scenarios from the real world and discuss the suitability of different scenarios for hypothesis testing.