The Sutton Academy

Knowledge Rich Curriculum Plan

Year 11 Foundation – Data and Statistics

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this, students need to already know that…*	Steps to Success
To learn how to solve problems involving the mean	• Students will know how to work backwards from the mean to solve problems involving finding the mean for a group within a group or for a whole group from two smaller sub-groups	**Mean –** the mathematical average of the set of two or more data values. It is calculated by adding up all of the data and dividing it by the number of pieces of data	• Students will need to know how to calculate the mean for discrete data	
To learn how to calculate averages from frequency tables	• Students will know how to calculate the mean from a frequency table • Students will know how to calculate the median from a frequency table • Students will know how to find the mode from a frequency table • Students will know how to calculate the range from a frequency table	**Mean –** the mathematical average calculated by adding up all of the data and dividing it by the number of pieces of data **Median** – the middle piece of data when the data is ordered from smallest to largest **Mode –** the value that occurs most often in the data. There may be no mode, or the data may be multi-modal **Range –** the difference between the largest and smallest values. This isn't actually an average – but it tells us how spread out the data is	• Students will need to know how to calculate the median, mode and range for discrete data • Students will need to know how to interpret a frequency table	**Steps to Success – Averages From Table** **1:** Create a column on the side of given table and label it 'Fx'. Go down each row and multiply each number in the first column by its corresponding frequency. Leave your answer for each in this column. 2: Add up each number you have calculated in your extra column, and leave the total at the base of the column. This is the called the sum of fx, usually denoted as $\sum fx$. 3: Now add up each number in your frequency column, and leave the total at the base of the column. This is the sum of the frequencies usually denoted $\sum f$ or n. 4: Now to find the mean you simply divide the sum of fx by the total frequency. Mean = $\frac{\sum fx}{n}$ or Mean = $\frac{\sum fx}{\sum f}$
To learn how to calculate averages from grouped frequency tables	• Students will know how to calculate the mean for a grouped frequency table • Students will know how to identify the modal class from a grouped frequency table. • Students will know how to find where the median lies in a grouped frequency table.	**Interval –** in maths, an interval is a set of real numbers between two given numbers called the endpoints of the interval **Mean –** the mathematical average calculated by adding up all of the data and dividing it by the number of pieces of data **Median** – the middle piece of data when the data is ordered from smallest to largest **Mode –** the value that occurs most often in the data. There may be no mode, or the data may be multi-modal	• Students will need to know how to calculate the mean and median and identify the mode for a non-grouped frequency table	**Steps to Success – Averages From Table** **1:** Create a column on the side of the table given and title this 'midpoint'. Add up the two numbers in your given data interval and divide them by two. Leave your answer for each in this column, these are now your 'x' values. 2: Create an additional column next to your midpoint (x) column, and label this 'Fx'. Go down each row and multiply each number in the midpoint column by its corresponding frequency. Leave your answer for each in this column. 3: Add up each number you have calculated in your 'Fx' column, and leave the total at the base of the column. This is the called the sum of fx, usually denoted as $\sum fx$. 4: Now to find the mean you simply divide the sum of fx by the total frequency. Mean = $\frac{\sum fx}{n}$ or Mean = $\frac{\sum fx}{\sum f}$

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To learn how to draw and interpret pie charts	• Students will know how to accurately draw a pie chart • Students will know how to interpret a pie chart • Students will know how to solve more complex problems involving pie charts	**Pie Chart –** a circular diagram which is divided into slices to illustrate numerical proportion **Sector –** a pie-shaped part of a circle made of the arc along with two radii	• Students will need to know how to draw and measure angles • Students will need to know that there are 360° around a point	**Steps to success - Drawing pie charts** **Step 1:** Find the total frequency. This total needs to be represented by 360° within your pie chart. **Step 2:** Divide 360 by the total frequency, this will give you the number of degrees each person is represented within the pie chart. **Step 3:** Multiply each group by the number you found in step two, this will let you know how many degrees is needed for each group. **Step 4:** Measure the degrees for each group on your pie chart and draw each sector. **Step 5:** Label your pie chart appropriately. **Steps to success – Interpreting pie charts** **Step 1:** Find the number of degrees for each sector within your circle. You may need to measure the angles with a protractor. **Step 2:** Find the fraction of the circle you have for your chosen sector, this will be your number of degrees out of 360°. Simplify, if possible. **Step 3:** Multiply the fraction you have found by the total frequency. This will give you the frequency for that sector.
To learn how to plot points and interpret scatter graphs	• Students will know how to plot points on a scatter graph • Students will know how to interpret scatter graphs in terms of the relationship between two variables. • Students will know how to identify outliers on scatter graphs and give reasons why there may be an outlier • Students will know how to draw the line of best fit on a scatter graph • Students will know that Science and Maths may draw a line of best fit differently – Science could be a curve • Students will know how to use a line of best fit to make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of doing so. • Students will know that correlation is a mutual relationship or connection between two or more things. • Students will know how to distinguish between positive, negative and no correlation using lines of best fit and	**Scatter Graph** – a type of mathematical diagram using coordinates to display values for two variables **Outlier –** a person or thing differing from all other members of a particular group or set **Correlation –** a mutual relationship or connection between two or more things.	• Students will need to know how to plot coordinates on a graph	Scatter graphs steps

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	interpret correlation in terms of the problem. • Students will know that correlation does not imply causality. • Students will appreciate that correlation is a measure of the strength of the association of the two variables and that zero correlation does not necessarily imply no relationship but simply no linear correlation. • Students will know how to state how reliable their predictions are, ie. Not reliable if extrapolated.			
To learn how to draw and interpret frequency polygons	• Students will know how to draw and interpret a frequency polygon	Frequency Polygon – a line graph of class frequency plotted against class midpoint	• Students will need to know how to plot coordinates • Students will need to know how to calculate averages	**Frequency** Polygons – Steps to Success Step 1 – Identify the **midpoints** Step 2 – Plot each frequency against the midpoint. Step 3 – Join up the points with a ruler, it is **imperative** that they are joined with straight lines.