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 for 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		• 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 • 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. •	**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	**Step 1:** Add another column onto the table and label this column midpoint, to find the values in your midpoint column you are looking for the number that is exactly half way between each group. **Step 2:** Add another column onto the table and label this fx, to find the values in your fx column, multiply the number in your midpoint by the frequency for that group. **Step 3:** Add up your fx column and frequency column. **Step 4:** Divide the total from the fx column by the total from the frequency column – this is your mean. Mean = $\frac{\Sigma fx}{n}$ or Mean = $\frac{\Sigma fx}{\Sigma f}$
To learn how to draw and interpret stem and leaf diagrams	• Students will know that we use stem and leaf diagrams to group all the data in to categories whilst still showing each individual result. • Students will know how to produce stem and leaf diagrams. • Students will know how to produce back to back stem and leaf diagrams. • Students will know how to interpret stem and leaf diagrams. • Students will know how to find the median, mode and range from stem and leaf diagrams. • Students will know how to compare the median, mode and range for data represented in back to back stem and leaf diagrams.	**Stem and Leaf Diagram –** a diagram where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits)	• Students will need to know how to calculate averages and range • Students will need to know how to order integers	**Step 1:** Work out what 'stems' you need. The 'stems' are all of the digits that make up the beginning of a number except for the last digit. *For example, the number 31 has a stem of 3, while the number 29 has a stem of 2. A one-digit number like 4 has a stem of 0. Think "04" for 4. A two digit integer like 678 has a stem of 67 and a decimal like 14.52 has a stem of 14.5 and so on…* **Step 2:** Draw a vertical line and list the stem numbers to the left of the line in order from smallest to largest **Step 3:** Fill in the leaves by listing them in order after their respective stem. The leaves are the last digit of each number in the data set. If there is more than one of the same number then you must list the leaf however many times it appears. **Step 4:** You must then provide a key explaining how to interpret your stem and leaf diagram

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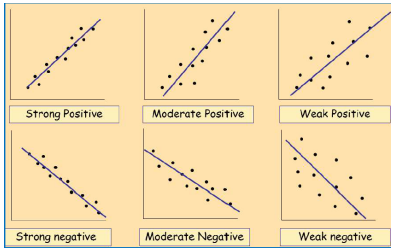
To learn how to draw and interpret pie charts	• Students will know how to accurately draw a pie chart • Students will know how to interpret a pie chart • Students will know how to solve more complex problems involving pie charts	**Pie Chart –** a circular diagram which is divided into slices to illustrate numerical proportion **Sector –** a pie-shaped part of a circle made of the arc along with its 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	Drawing: **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. Interpret: **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 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 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.	**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** statistical term describing the degree to which two variables move in coordination with one-another. **Positive correlation** - as one variable increases, the other one also increases. **Negative correlation -** as one variable increases, the other decreases.	• Students will need to know how to plot coordinates on a graph	Step 1: Decide the Two Variables. The most important step of the analysis is performed even before the analysis begins. Step 2: Collect Data. Step 3: Map the Data onto the graph by plotting the co-ordinates. Step 4: Draw the Line of Best Fit. Step 5: The correlation can be described as…  Step 6: Use your line of best fit to estimate your answers.

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