The Sutton Academy

Knowledge Rich Curriculum Plan

Year 8 Prime – 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…*	Assessment
To learn how to find the averages and range from a list of data values.	• Students will know that the mode is the value that appears most often in a set of data values. • Students will know how to find the mode from a set of data values. • Students will know that there can be two modes. • Students will know that there can be no mode. (Please emphasize that they need to state it has no mode rather than use 0) • Students will know that the median is the middle value from an ordered list of numbers. • Students will know how to find the median from an odd amount of data values. • Students will know how to find the median from an even amount of data values. • Students will know that the range of a set of data is the difference between the largest and smallest values. • Students will know that the range measures the spread of the data. • Students will know that the mean is the average of a set of numbers. • Students will know that to find the mean of a data set, they must find the sum the numbers in the set and then divide that total by the number of numbers in the set. • Students will know how to make basic comparisons between averages or range. • Students will know how to recognise the advantages and disadvantages between measures of average.	Average – a number expressing the central or typical value in a set of data, in particular the mode, median, or (most commonly) the mean Mode – the value that occurs most often in the data. If no number in the list is repeated, then there is no mode for the list. If there is more than one it is considered to be multi-modal Median – the middle piece of data when the data is ordered from smallest to largest 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. Range – the difference between the largest and smallest values. This isn't actually an average – instead it tells us how spread out the data is.	• Students will know how to identify and categorise data as qualitative and quantitative • Students will know how to identify and categorise data as discrete and continuous	Mini-Assessment 12
To learn how to find the averages and range from frequency tables.	• Students will know how to find the mode from a frequency table by finding the data value which corresponds to the highest frequency. • Students will know how to find the median from a frequency table by finding the data value which corresponds to the middle frequency value. • Students will know how to find the mean of a frequency table by finding the sum of the products of each data value and the corresponding frequency and then dividing this by the total frequency. • Students will know how to find the range from a frequency table by finding the difference between the highest and lowest data value. • Students will know how to find missing data within a frequency table using the averages and range.		• Students will know how to find the averages and range from a list of data values.	Mini-Assessment 12
To learn how to find the averages from grouped frequency tables.	• Students will know that a grouped frequency table represents data that falls within class intervals. • Students will know that the actual data values are unknown. • Students will know how to find the modal class from a grouped frequency table by finding the class interval which corresponds to the highest frequency. • Students will know how to find the median class from a grouped frequency table by finding the class interval which corresponds to the middle frequency value. • Students will know how to find an estimate for the mean from a grouped frequency table by finding the sum of the products of each mid-point of the class interval and the corresponding frequency and then dividing this by the total frequency. • Students will know that the mean is an estimate because the data values are unknown. • Students will know that by using the mid-points to find the mean you are assuming that the data is equally spread out within each interval.	Interval – in maths, an interval is a set of real numbers between two given numbers called the endpoints of the interval	• Students will know how to find the averages from frequency tables.	Mini-Assessment 12

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	• Students will know how to find missing data within a grouped frequency table using the averages.			
To learn how to draw and interpret bar charts.	• Students will know that a bar chart is a diagram in which the numerical values of variables are represented by the height of bars of equal width. • Students will know that bar charts are used to represent data to make it easy to read and compare. • Students will know that we can only compare bars within the same scale. • Students will know how to draw, label and scale axes. • Students will know how to draw bar charts for discrete and continuous data. • Students will know how to construct a bar chart from information given in a tally chart. • Students will know how to use a tally chart to draw a bar charts which involves continuous data. • Students will know how to read frequency values from a bar chart. • Students will know how to recognise simple patterns, characteristics and relationships in bar charts. • Students will know how to calculate total population from a bar chart or table. • Students will know how to find the greatest and least values from a bar chart. • Students will know how to compare data within a bar chart. • Students will know how to compare two different bar charts. • Students will know how to recognise misleading bar charts and explain how it is misleading. **Opportunity for challenge:** • Students will know how to find the averages and range from a bar chart.	**Tally Chart –** a simple way of recording and counting frequencies. Each occurrence is shown by a tally mark and every fifth tally is drawn diagonally to make a "gate" of five **Bar Chart –** a diagram in which the numerical values of variables are represented by the height or length of lines or rectangles of equal width	• Students need to know how to sequence numbers in a pattern. • Students need to know that qualitative data is data with non-numerical data. • Students need to know that discrete data is data that can only take certain numerical values. • Students need to know that continuous data is data that can take any value within a given range. • Students need to know how to complete a tally chart.	Mini-Assessment 12
To learn how to draw comparative bar charts.	• Students will know that a comparative bar chart places bars representing sections from the same category adjacent to each other. • Students will know how to draw a comparative bar chart. • Students will know how to interpret a comparative bar chart. • Students will know how to write a key and interpret a key for each set of bars within a comparative bar chart. **Opportunity for challenge:** • Students will know how to draw a composite bar chart.		• Students need to know how to draw a bar chart.	Mini-Assessment 12
To learn how to draw and interpret pictograms.	• Students will know that a pictogram is a chart that uses pictures to represent data. • Students will know that we use pictograms to represent data in a more interesting and engaging way that makes it more memorable. • Students will know how to complete a pictogram given numerical values. • Students will know how to use the key to find frequency values from a pictogram. • Students will know how to interpret the data within a pictogram to answer simple questions. • Students will know how to draw a key for a pictogram. **Opportunity for challenge:** • Students will know how to complete pictograms based on more complex problems.	**Pictogram** – a chart that uses pictures to represent data.	• Students need to know how to multiply and divide integers.	Mini-Assessment 12

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To learn how to draw stem and leaf diagrams.	• Students will know that a stem and leaf is a diagram that quickly summarizes data while maintaining the individual data points. • 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 to draw stem and leaf diagrams by splitting the tens and units column. The tens column becomes the 'stem' and the units become the 'leaf'. • Students will know that stem and leaf diagrams must be in order to read them properly. • Students will know that stem and leaf diagrams require a key so that the data can be interpreted correctly. • Students will know that they must use the key to interpret the values on a stem and leaf diagram, eg. $3\|7 = 37$ and not just 7. • Students will know how to read values from a stem and leaf diagram. • Students will know how to find how many pieces of data are above or below a certain value. • Students will know how to use fractions to represent how many pieces of data are above or below certain values. • Students will know how to find the averages from a stem and leaf diagram. **Opportunity for challenge:** • Students will know how to draw a back-to-back stem and leaf diagram.	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 need to know how to order numbers. • Students need to know and be able to indicate the tens and units of numbers.	Mini-Assessment 12
To learn how to draw pie charts.	• Students will know that a pie chart is a circular statistical graphic which is divided in to slices to illustrate numerical proportion. • Students will know that we use a pie chart for expressing a part-to-whole relationship in a visual way which makes it easy to compare results. • Students will know how to construct pie charts for categorical data and discrete/continuous numerical data.	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 need to know how to draw angles using a protractor. • Students need to understand proportional reasoning.	Mini-Assessment 12
To learn how to interpret pie charts	• Students will know how to interpret simple pie charts using simple fractions and percentages such as a half or 25%. • Students will know how to find the mode from a pie chart. • Students will know how to find the total frequency from a pie chart. • Students will know how to find the frequency represented by each sector. • Students will know that a sector is portion of a circle enclosed by two radii and an arc. • Students will know how to compare angles with values in a real-life context and use this to calculate the values of other angles or find the angles of other values. • Students will know how to understand that the frequency represented in corresponding sectors in two pie charts is dependent upon the total populations represented by each of the pie charts. **Opportunity for challenge:** • Students will know how to compare two pie charts.		• Students need to know how to draw a pie chart. • Students need to know how to find the mode from a list of values. • Students need to know that there are 360° in a full turn. • Students need to understand proportional reasoning.	Mini-Assessment 12
To learn how to draw scatter graphs.	• Students will know how to draw scatter graphs from given data values. • Students will know how to finish a scatter graph that has been partially completed. • Students will know how to draw a line of best fit. • Students will know if the data has positive correlation, negative correlation or no correlation.	Scatter Graph – a type of mathematical diagram using coordinates to display values for two variables Correlation – a mutual relationship or connection between two or more things.	• Students need to know how to plot and read coordinates. • Students need to know how to draw a straight line. • Students need to understand the relationship between two variables and be able to describe it.	Mini-Assessment 12

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	• Students will know how to describe the relationship between the two variables on a scatter graph.		• Students need to know how to recognise positive correlation, negative correlation and no correlation.	
To learn how to interpret scatter graphs.	• Students will know that an outlier is a data point which falls outside the normal range of data. • Students will know how to identify outliers on a scatter graph. • Students will know how to interpret points on a scatter graph. • Students will know how to use their line of best fit to estimate values from a scatter graph. • Students will know how to explain an isolated point on a scatter graph within the real-life scenario. **Opportunity for challenge:** • Students will understand causality, extrapolation and interpolation.	Outlier – a person or thing differing from all other members of a particular group or set	• Students need to know how to plot a scatter graph. • Students will know how to draw a line of best fit.	Mini-Assessment 12
To learn how to draw a time series graph.	• Students will know that time-series graphs can be used to visualise trends in numerical values over time. • Students will know how to draw line graphs for time-series. **Opportunity for challenge:** • Students will know how to interpret time-series tables and graphs.		• Students need to know how to plot coordinates.	Mini-Assessment 12