The Sutton Academy

# Knowledge Rich Curriculum Plan

Year 8 Support – Data and Statistics 2

| Lesson objective | Intended Knowledge: | Tiered Vocabulary | Prior Knowledge: | Steps to Success | Feedback |
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| **To learn how to draw and interpret pictograms.** | • Students will know how to complete a pictogram given numerical values.<br>• Students will know how to use the key to find frequency values from a pictogram.<br>• Students will know how to interpret the data within a pictogram to answer simple questions.<br>**Opportunity for challenge:**<br>• Students will know how to draw a key for a pictogram. | Pictogram – a chart that uses pictures to represent data | • Students need to know how to complete and interpret a tally chart. | **Steps to Success – Interpreting Pictograms**<br>**1. Look at the Key**<br>The key shows what one picture or symbol stands for.<br>Example: 🍎 = 2 apples<br>If there is half a picture, it means half the value.<br>**2. Count the Pictures**<br>Count how many full pictures and half pictures are shown.<br>**3. Do the Maths**<br>Multiply the number of pictures by the value in the key.<br>Then follow what the question asks (e.g. find the total, the biggest, or the difference).<br><br>**Steps to Success - Drawing Pictograms**<br>**1. Collect Your Data** - Gather the information or numbers you want to show in your pictogram.<br>**2. Choose a Symbol** - Pick a simple picture or shape to represent your data (e.g. a circle, star, or smiley face).<br>Make sure it's easy to draw and repeat.<br>**3. Decide on a Key** - Choose how much each symbol is worth (e.g. 1 symbol = 5 items). Use half symbols if needed to represent smaller values.<br>**4. Draw a Title** - Add a title at the top to explain what the pictogram shows.<br>**5. Label Each Row** - Write the name or category for each row (e.g. Apples, Bananas, Oranges).<br>**6. Draw the Symbols** - For each row, draw the correct number of symbols based on your data and key.<br>**7. Include the Key** - Add the key clearly at the bottom or side of your pictogram so others know what each symbol means. | |
| **To learn how to draw stem and leaf diagrams.** | • 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'.<br>• Students will know that stem and leaf diagrams must be in order to read them properly.<br>• Students will know that stem and leaf diagrams require a key so that the data can be interpreted correctly. | 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.<br>• Students need to know how to identify the value of a digit within a number. | Steps to Success - Drawing<br>**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. *E.g. the number 31 has a stem of 3 and a leaf of 1.*<br>**Step 2:** Draw a vertical line and list the stem numbers to the left of the line in order from smallest to largest.<br>**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 numbers then you must list the leaf however many times it appears.<br>**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 interpret stem and leaf diagrams.** | • Students will know that they must use the key to interpret the values on a stem and leaf diagram, e.g. $3\|7 = 37$ and not just 7.<br>• Students will know how to read values from a stem and leaf diagram.<br>• Students will know how to find how many pieces of data are above or below a certain value.<br>• Students will know how to use fractions to represent how many pieces of data are above or below certain values.<br>**Opportunity for challenge:**<br>• Students will know how to find the averages from a stem and leaf diagram. | | • Students need to know how to draw a stem and leaf diagram. | <u>Steps to Success - Interpreting</u><br><u>Range</u><br>**Step 1 –** Identify the smallest and largest value in your stem and leaf diagram.<br>**Step 2 –** Subtract the largest value from the smallest value, this is your range.<br><u>Mode</u><br>**Step 1 –** It is easy to mistake that the mode is the most common integer, but it is actually the most common integer in a row!<br><u>Median</u><br>**Step 1 –** Cross the smallest number and largest value in the stem and leaf diagram.<br>**Step 2 –** Repeat this until you have either one or two digits left.<br>- If you have one digit left, this is your median. Remember to use the key to find the value.<br>- If you have two digits left, add both together and half it to find the median. Remember to use the key to find the value of this item. | |
| **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.<br>• 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.<br>• 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<br>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. | <u>Steps to success - Drawing</u><br>**Step 1:** Find the total frequency. This total needs to be represented by 360° within your pie chart.<br>**Step 2:** Divide 360 by the total frequency, this will give you the number of degrees each person is represented within the pie chart.<br>**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.<br>**Step 4:** Measure the degrees for each group on your pie chart and draw each sector.<br>**Step 5:** Label your pie chart appropriately. | |
| **To learn how to interpret simple pie charts** | • Students will know how to interpret simple pie charts using simple fractions and percentages such as a half or 25%.<br>• Students will know how to find the mode from a pie chart.<br>• Students will know how to find the total frequency from a pie chart.<br>• Students will know how to find the frequency represented by each sector.<br>• Students will know that a sector is portion of a circle enclosed by two radii and an arc.<br>**Opportunity for challenge:**<br>• Students will know how to compare angles with values in a real-life context and use this to calculate the values of other angles | | • Students need to know how to measure angles<br>• Students need to know how to find fractions of amounts. | <u>Steps to success – Interpreting pie charts</u><br>**Step 1:** Find the number of degrees for each sector within your circle. You may need to measure the angles with a protractor.<br>**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.<br>**Step 3:** Multiply the fraction you have found by the total frequency. This will give you the frequency for that sector. | |

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| | or find the angles of other values. | | | | |
| **To learn how to draw scatter graphs.** | • Students will know how to draw scatter graphs from given data values.<br>• Students will know how to finish a scatter graph that has been partially completed.<br>• Students will know how to draw a line of best fit. | Scatter Graph – a type of mathematical diagram using coordinates to display values for two variables | • Students need to know how to plot and read coordinates. | | |
| **To learn how to interpret scatter graphs.** | • Students will know if the data has positive correlation, negative correlation or no correlation.<br>• Students will know how to describe the relationship between the two variables on a scatter graph.<br>• Students will know that an outlier is a data point which falls outside the normal range of data.<br>• Students will know how to identify outliers on a scatter graph.<br>**Opportunity for challenge:**<br>• Students will know how to use their line of best fit to estimate values from a scatter graph. | Outlier – An outlier is a data point that is significantly different from the rest of the data in a dataset. It lies far outside the typical range of the data.<br><br>Correlation – a relationship between two variables. | • Students need to know how to plot a scatter graph.<br>• Students will know how to draw a line of best fit. | <u>Correlation</u><br>When two sets of data are strongly linked together, we say they have a **High Correlation**.<br>• Correlation is **Positive** when the values **increase** together, and<br>• Correlation is **Negative** when one value **decreases** as the other increases<br><u>Line of best fit</u><br>The line of best fit is used to express a relationship in a scatter plot of different data points. It is also a way for us to predict or estimate values using the trends in the data. The line of best fit will be different for everyone, but it must:<br>• Go through as many points as possible<br>• Follow the trend of the data<br>• Have an equal amount of points, or close to equal, either side of the line<br>• Not go through (0,0) | |
| **Mini-Assessment 13** | | | | | |