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| **Core Knowledge Map** |
| Subject: Mathematics | Year: 10 | Term: Autumn 2 |
| What are we learning? |
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| **Unit 2. Processing and respresenting data** |
| * To be able to draw and interpret various tables including; database, two-way table.
* To be able to draw and interpret various charts and diagrams including; pictograms, bar charts, vertical line charts, stacked and composite bar charts, stem and leaf diagrams, back-to-back stem and leaf diagrams, pie charts, comparative pie charts, population pyramid, choropleth diagram, cumulative frequency diagram, frequency polygon, histogram.
* To understand the shape of a distribution can be either positive, negative or symmetrical.
* To be able to calculate frequencies from comparative pie charts.
* To be able to calculate estimates to the median, upper and lower quartile and inter-quartile range from a cumulative frequency polygon.
* To be able to calculate frequency and frequency densities for histograms including estimated frequencies.
* To understand how diagrams and charts can be used to mislead data and how to correct them.
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| How will I be assessed? |
| Retrieval Tasks, Exit Tickets, Topic Test at the end of the half term. |
| Big questions: |
| Can You….?* For what type of data should you use a bar chart?
* For a comparative pie chart, what do the different areas represent?
* What does the trend in data for a given vertical line chart suggest?
* Calculate the Inter-quartile range (IQR) from a given cumulative frequency diagram?
* Given an incomplete two-way table, can you calculate the probability of a specific event occurring?
* Estimate the frequency from an histogram by using partial areas of bars?
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| How does this build on previous learning? | How will this link to my future learning? |
| * Students will be familiar with several charts and diagrams from both Key stage 2 and 3 including; pictograms, bar charts, composite and stacked bar charts, vertical line charts, stem and leaf and back-to-back stem and leaf diagrams, pie charts, cumulative frequency diagrams, frequency polygons.
* Students should also be familiar with calculating the mean, median, upper and lower quartiles and inter-quartile range including from cumulative frequency polygons from Key stage 3 Maths.
* Students should be familiar with the basics of probability from Key stage 3 Maths.
 | * Understand the role manipulation and choice of data display can impact observers’ opinions and that the choice of display should be affected by the type of data.
* Data display via charts and diagrams is frequently encountered in topics such as; Chemistry, Physics, Biology, Psychology, Economics and Business Studies, Geography, Travel and Tourism as well as covered loosely in A-level Maths (Statistics component).
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| Core knowledge: | Key vocabulary: |
| * ***Bar Charts*** use discrete data and can be display in stacked (composite) form whereby different groups such as gender are stacked one on top of the other. They may also be displayed side by side for greater comparison.
* ***Two-way tables*** are an efficient way of comparing values for bivariate data and can be effective for calculating probabilities.
* ***Stem-and-leaf diagrams*** help show patterns in data and skew and can be back-to-back to compare two categories. Along with ***pictograms*** emphasis must be made on the use of a key.
* Cumulative frequency diagrams are effective for estimating the ***median and quartiles***.
* The proportion of the area of two comparative pie charts is equal to the proportion of their frequencies. We can also calculate one radius of a pie chart using $r\_{2}=r\_{1}\frac{\sqrt{F\_{2}}}{√F\_{1}}$.
* For an histogram, $frequency density=\frac{frequency}{class width}$. This also means that $frequency=frequency density ×class width$. An estimate of the frequency from an histogram can be gained by calculating the area of the bars within the given range.
* A population pyramid shows a distribution of ages for two given categories such as gender.
* A choropleth map splits a geographical area into different regions where the darker the shade of the colour the higher the proportion.
 | **Charts and Diagrams:** Pictogram, stacked, composite, polygon, frequency, cumulative, histogram, stem and leaf, two-way table, data, continuous, discrete, pyramid, population, choropleth, misleading, representative, comparative, pie chart, bar chart, vertical line chart, frequency density, estimation. |
| Need more help? Refer to the knowledge organiser uploaded to Class Charts at the start of the year. |