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| **Core Knowledge Map** |
| Subject: Mathematics | Year: 10 | Term: Autumn 1 |
| What are we learning? |
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| **Unit 1. Collection of Data** |
| Unit 1b. Populations and Sampling | * To understand the difference between a population, sample frame and sample.
* To be able to identify the population and a suitable sampling frame.
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| Unit 1b. Sampling Methods | * **(H)** To be able to estimate using the Peterson Capture-Recapture method as well as undestand the assumptions made.
* To understand the different types of sampling methods as well as their advantages and disadvantages
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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….?* Name one advantage and one disadvantage of using opportunity over systematic sampling.
* If you wanted to investigate the average temperature per year against the change in sea level, what would be a good hypothesis?
* A scientist wants to estimate the population of frogs in a pond. They capture 100 frogs and tag them before releasing them back into the pond. A Week later, the scientist captures 40 frogs from the pond, 16 have already been tagged. Estimate the population of frogs around the pond and state how reliable this method is.
* A geologist is boring holes into a field to check the percentage of clay in the dirt. State the population for the geologist’s investigation.
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| How does this build on previous learning? | How will this link to my future learning? |
| * In both Key Stage 3 and 4 (GCSE Maths), students will have encountered types of data and should be familiar with specific types such as qualitative/quantitative data as well as recognising the difference between discrete and continuous data.
 | * Understanding the different types of data, how to collect them, their advantages and disadvantages is an essential part of the Data Handling Cycle.
* Statistical enquiry, including data collection is essential in some sciences including Psychology, Biology, Chemistry and Physics as well as having an important role in Geography and Business Studies. It is also a core topic in A-Level Maths.
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| Core knowledge: | Key vocabulary: |
| * A ***population*** is everyone or everything that can be involved in an investigation. A ***Census*** is a survey of the entire population.
* A ***Sample*** is a smaller subset of the population and the ***sampling frame*** is the list of members of a population. A ***sampling unit*** is everyone or everything that is to be sampled.
* Samples can be ***Random*** where everything in the sample has an equal chance, ***stratified,*** where the same proportion of different groups is sampled, ***systematic,*** where units are chosen at regular intervals, ***cluster,*** where every member of a random group is sampled, ***quota,*** where a fixed amount is taken from each group, ***opportunity,*** where you take what is available at the time of sampling, or ***judgement,*** where the observer makes a judgement on a suitable sample.
* ***(H) Peterson Capture-Recapture*** is used to make estimates of a population using the formula $\frac{First capture}{Total}=\frac{Tagged}{Second capture}$
 | **Populations and Sampling:** Population, Census, Sample, Sampling Frame, Sampling Unit, Bias. **Sampling Methods:** Random, Stratified, Systematic, Cluster Opportunity, Judgement, Estimate. |
| Need more help? Refer to the knowledge organiser uploaded to Class Charts at the start of the year. |