

Essential Knowledge Milestones	Teaching Points
<ul style="list-style-type: none"> <li>Understand 'population', 'sample', and 'census', and comment on the advantages and disadvantages of each</li> <li>Understand the advantages and disadvantages of simple random sampling, systematic sampling, stratified sampling, quota sampling and opportunity sampling</li> <li>Define qualitative, quantitative, discrete and continuous data, and understand grouped data</li> <li>Understand the large data set and how to collect data from it, identify types of data and calculate simple statistics</li> </ul>	<ul style="list-style-type: none"> <li>This section is a great opportunity to introduce the large data set to look at a population of data and discuss reasons for sampling from it.</li> <li>Students will be expected to be able to comment on the advantages and disadvantages associated with a census and a sample.</li> <li>Discuss in context the meanings of populations and samples. Look at data from populations and samples, initially using data from the sample to make inferences about the population before then checking the data for the population. Be aware that different samples can lead to different conclusions. Actually getting students to models this can be quite a powerful activity.</li> <li>Discuss the advantages and disadvantages of sampling making sure to include time, cost etc. However, in terms of marks schemes time and money are often seen as linked, you can't put both down and expect 2 marks.</li> <li>Ensure students are given the opportunity, and are able, to give full and thorough answers within the context of the question.</li> <li>Students will also be expected to be familiar with different types of sampling including simple random, stratified, systematic, quota and opportunity (convenience) sampling.</li> <li>Students will gain a more thorough understanding of the types of sampling if the advantages and disadvantages alongside the method used for each type are understood. They will then be more able to select an appropriate technique for a given statistical problem and be able to critique a technique which has been used. Share some techniques with them and discuss why it would or wouldn't be appropriate. Eg. Why wouldn't it be good to ask people 'Do you like football?' at 3pm on Saturday in a shopping centre. Why is a systematic sample the best thing to do if QA'ing products on a production line?</li> <li>Give students the opportunity to use the techniques they learn about on the large data set.</li> <li>Ensure that you spend a lesson on the large data set making sure that students are aware of the key features. Completing the investigation on taking samples. It's an excellent way to visualize how the different sampling techniques work and how they can give rise to different conclusions around the room – an important learning point!</li> </ul>
<p style="text-align: center;"><b>Success Criteria</b></p>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Define Census and Sample and be able to discuss the advantages and disadvantages of each</li> <li><input type="checkbox"/> Describe how to perform the 3 random sampling techniques and be able to discuss the advantages and disadvantages of each</li> <li><input type="checkbox"/> Describe how to perform the 2 non-random sampling techniques and be able to discuss the advantages and disadvantages of each</li> <li><input type="checkbox"/> Be able to define qualitative, quantitative, continuous and discrete data. Be able to correctly identify these types.</li> <li><input type="checkbox"/> Have an understanding of the large data set, the locations, the years, the units and the measures involved</li> </ul>	
<p style="text-align: center;"><b>Assumed Prior Knowledge/ Links / Interleaving</b></p>	
<p><b>GCSE (9-1) in Mathematics at Higher Tier</b></p> <ul style="list-style-type: none"> <li><b>S1</b> Infer properties of populations or distributions from a sample, while knowing the limitations of sampling</li> <li><b>S5</b> Apply statistics to describe a population</li> </ul>	

<b>Potential Barriers to Access /Misconceptions</b>		<b>Opportunities for Reasoning/Problem Solving/Proofs</b>	
<ul style="list-style-type: none"> <li>Some students confuse sample sizes and population sizes, but the recurring problem is not giving answers in context. Candidates need to be clear about the difference between sample sizes and population sizes.</li> <li>Students need to be able to describe the sampling techniques clearly and will lose marks if they are not sufficiently precise.</li> <li>As always, answers must be given using the context of the question and not simply be quoted from text books in a general form.</li> <li>Doing the investigation is excellent and has a high quality walk through but some will still struggle with the IT skills.</li> </ul>		<ul style="list-style-type: none"> <li>The biggest opportunity here is introducing students to the large data set and starting to get them familiar with the data included in it.</li> </ul>	
<b>Key Mathematical Vocabulary</b>	Population, census, sample, sampling unit, sampling frame, simple random sampling, stratified, systematic, quota, opportunity (convenience) sampling.		
<b>Personal Development</b>		<b>Notes</b>	<b>Resources</b>
<p>Pupils are taught that they must 'respect' each other's opinions and well-being when working collectively in class. Pupils to learn that mathematicians have 'ambition' to push boundaries when aiming to solve new problems</p> <p><b>Resilience</b> – never giving up! Building confidence across the problem solving aspects of the course.</p> <p><b>Ambition</b> – living life to the full – fulfilling dreams and aspirations – linking to future career and ambition plans.</p> <p><b>Respect</b> – respect for others – the 9 protected characteristics</p> <p><b>Personal Best</b> – First Work – Best Work every time</p>			<ul style="list-style-type: none"> <li>Edexcel Large Data Set</li> <li>Dates sampling activity</li> <li>Easy fill sampling techniques tables</li> </ul>