Edexcel Geography A-level

Fieldwork Section 2 - Methodology
Essential Notes

Introduction

This stage of the investigation involves **collecting data**. To ensure the data collected is **relevant**, **accurate** and **reliable**, the **practical approaches (techniques) used** must be justified. **'Techniques'**, refers to the different ways that data can be collected, such as photographs, land use surveys, measurements, questionnaires etc.

Types of Data

You may collect data **in groups or individually**. It is important that the techniques used allow different **types of data** to be collected. These include:

Primary Data: Data that you have collected. It includes: questionnaires, interviews, pedestrian counts etc.

- Primary data is **advantageous** as you can relate it to the specific focus of your investigation and any mistakes and anomalies can be identified and corrected. It is very reliable as you are the source, so you know the data collection strategies used to obtain the data.
- However, **disadvantages** of primary data such as lack of resources, equipment, time and potential researcher bias, mean secondary data is also required.

Secondary data: Data that is collected from other sources and may be **statistical, graphical or written**. It includes: books, leaflets, websites, songs, podcasts etc.

- **Secondary data** is **advantageous** when it is **impractical** or **impossible** to use primary data collection. For example, if data on the annual rainfall in a drainage basin for the past 10 years was required, it would be impossible to collect this information first hand!
- You should record information about a secondary data source **as you go along**, using a **referencing style** such as *Harvard* - note your references down **during** your investigation.
- **Disadvantages** of secondary data can be its **unreliability**. It is important to consider the **reliability of secondary data**, which could be acknowledged in your work and considered when analysing this data. Reliability can be assessed by asking the following questions:

  - When was the data published?
  - Is the source of the data reliable?
  - Is the data well presented?
  - What was the purpose of the data?
  - Are there any anomalies or errors?

Qualitative data: data that is non-numerical (such as: photos, sketches, interview answers etc.)

- **Qualitative data** is **advantageous** as it provides **opinions** that may not necessarily be reflected by **numerical data**. Also, qualitative data can allow you to **explore different areas** within your investigation that may not be visible from numerical data. For example, when questioning a member of the local council, they may direct you in other areas to research and provide you with sources you wouldn't originally have access to.

- The **disadvantages** of qualitative data are that the data is **complex to analyse** and **subjective**. This data is difficult to compile into an easily understandable format or in graphical representation.

Quantitative data: numerical data that usually allows statistical analysis (such as: pedestrian counts, traffic frequency surveys, rainfall measurements etc.)

- The advantages of **quantitative data** are that it is **precise** and **easy to analyse**. Patterns can be spotted to provide accurate evidence for your investigation.
- Quantitative data has **disadvantages** in that it may **suggest correlations that do not exist**. Furthermore, it r**educes complex situations and views down into numbers**.

For higher level students, a mix of both **qualitative and quantitative** data from a **range of sources** is necessary to ensure your investigation can come to a **thorough conclusion**.

Variety of Data
When collecting your data, remember that you need a **variety of data** so that in your **analysis** you have multiple sources to analyse.

Higher level candidates will have a **range** of **presentational techniques** such as: different **graphs and charts**, **cartographic (maps) presentation, photos and sketches** etc. Candidates may also wish to do **statistical analysis** when **analysing** data further into the investigation e.g. *Spearman's Rank*. Therefore, it is **vital** that the data you plan to collect gives enough **opportunity** for a variety of techniques. This is especially true if your place of investigation is not easily **accessible** for you or your investigation is time specific, as you may not be able to go back to collect more data.

Sampling

Sampling is a **statistical method** used to collect **smaller** yet **reliable, manageable** sets of data. Sampling is used to select a representative smaller group from the **parent population (the population which the sample is taken from)**. Samples allow time and resources to be saved.

Sample Sizes
Your sample size is the **number of observations** taken in your data collection. For example, if you measured the length of 110 rocks on the beach, the sample size is 110. If you surveyed 70 people on a street, the sample size is 70.

Sample sizes that are **too small** are usually not **representative** and it is hard to spot **anomalies**. Sample sizes that are **too large** are overwhelming and **difficult to analyse**. Therefore, it is important to **justify** why the sample size you choose is **relevant/representative.**

Types of Sampling
There are **several types of sampling**, and you should **justify** why the method you choose is **appropriate** for the data you are collecting.

You may wish to use **more than one sampling technique**, which is fine as long as you explain your reasoning. It may be useful to research other types of sampling so that you choose a suitable technique. Here are some examples:

Random Sampling

Random sampling is self-explanatory, it is **sampling** in which the subjects are chosen **randomly.**

For example, a student approaches 5 random people in a street and asks them to complete the survey - there is no order in which the student does this.

In **theory**, random sampling is effective because every subject has an **equal chance** of being selected. Samples should be **representative of the parent population** being surveyed which eliminates bias. However in **practice**, there can be some **unintentional bias** causing **unreliability**.

Systematic Sampling

Systematic sampling is where a **set system** for choosing subjects is used, so that the subjects are chosen at **periodic intervals**.

For example, a student surveys 1 person per 5 people that pass by, until 50 surveys have been completed.
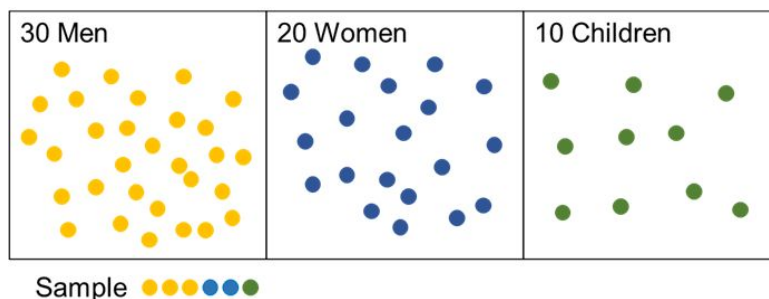
This sampling technique is effective as it theoretically **reflects a larger population or concept** and it **avoids bias**.

Stratified Sampling

Stratified sampling is where subjects are put into groups and **sampled in proportion to an external factor** such as the group size.

For example, if there are 30 men, 20 women, and 10 children in a population, a student surveys 3 men, 2 women, and 1 child in their sample.

This technique is effective in reflecting a larger group **accurately** because it is **proportional**. However, if the sample size is too small it may be **inaccurate**.

Cluster Sampling

Cluster sampling is where the **population** is divided into already existing **groups** (clusters). The clusters could be age, gender, etc. Samples of the clusters are then taken dependent on the investigation.

For example, in a school with 50 classes from years 7-13, 4 classes are sampled. These samples may be chosen **randomly** or **systematically.**

Population

Colours indicate different pre-determined clusters

Example sample
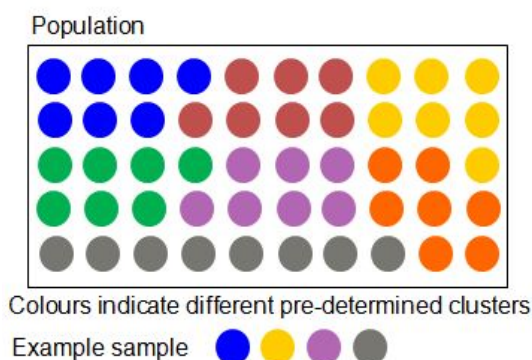
This sampling technique is **advantageous** because it saves time and resources - easily accessible groups can be chosen rather than sampling an entire population. However, this sampling technique is usually **less precise** as it does not reflect **every different group in the population**, meaning certain **demographics** can sometimes be **ignored**.

To overcome the issue of **misrepresenting** the population, you should sample clusters that **represent the demographic**. For example, if 4 classes in year 7 were the only clustered sampled, older groups' opinions would be ignored. However, if year groups 7, 9, 11, and 13 were surveyed, this more accurately represents the opinions within the 50 classes. A **stratified** sample can also be carried out **after** data collection to ensure all of the demographic groups are all considered **equally,** but a **large sample size** is needed.

Convenience/ Probability Sampling

In convenience sampling, samples are chosen based on what is **available** to the investigator. The first available information is most likely used. **Quota sampling** can also be a type of convenience sampling, in which a sample size is **predetermined**.

For example, in a population of 50, the surveyor asks the first 5 people seen to complete a survey.

This sampling technique will **save time** and **resources**. However, it is highly at risk of **bias** and **misrepresenting the parent population**, meaning it is usually **not a highly regarded technique**.

Writing Up - Methodology

It does not matter whether you use **future** or **past** tense within your write up. As a general rule, **future tense** is used for **planning**, **past tense** is for **analysis**. If you haven't carried out your investigation, then obviously choose future. Use the following points to write your methodology, which can be in the form of **paragraphs** or a **table**.

Technique	Why used/ purpose	Method: when/where	Justification of sampling type (if any)	Problems/ limitations	Improvements
Field measurements					
Land-use survey					
Field sketch					
Photographs					
Questionnaire/ Interview					

Source:<http://filestore.aqa.org.uk/resources/geography/AQA-7037-TG-F.PDF>

- **Purpose** - Why have you used this practical approach? What hypothesis/sub-questions does it link to? What data will you collect from this technique? Why is this appropriate for your investigation?

- **Time/ date** - When did you/are you planning to collect your data? Are the time periods you are using appropriate? Will they allow you to collect enough valid data? Will the times/dates affect your data? Are there peak times such as holidays that may affect your results and lead to unreliable data? Have you repeated your methods on different times/days to ensure your data's reliability and reproducibility?

- **Sampling** - What sampling technique have you used? Why have you used this? Why is it the most valid data collection approach? Could it cause any problems?

- **Types of data** - Is it primary or secondary data? Is it qualitative or quantitative data? Have you collected this data yourself or in a group? Why is this the most relevant type for your hypothesis?

- **Problems** - Are there any limitations to your data collection? Is there any bias present? What other variables are there? How can you control or account for these? Did you originally plan for something different that could not be completed? Did you make any improvements after collecting this data to make it more reliable or valid? Be careful not to go too far into an **evaluation** of your technique though, as this is a separate task that you will complete after your analysis.

- **Risk Assessment** - Higher level students may wish to conduct a risk assessment as it shows a thorough understanding of the **issues** arising throughout your investigation. You could rate the risk low/medium/high, include the **control measure** to minimise risk, and also include **ethical issues** as your investigation may be a risk to others (e.g. their privacy). An example risk assessment (in table format) is hown below:

Potential Hazard	Severity of Consequences (A)	Likelihood to Occur (B)	Risk Rating Without Mitigation (A x B)	Methods of Control

Severity of Consequences	Likelihood to Occur	Risk Rating without Mitigation
5 – Fatality/Major Injury	5 – Very Likely	Severity of Consequences x Likelihood to occur (Out of 25)
4 – Major Injury	4 – Likely	1-8 Low Risk
3 – Injury/Illness	3 – Possible	9-17 Medium Risk
2 – Minor Injury	2 – May	18-25 High Risk
1 – Slight Inconvenience	1 - Unlikely	

Order

The **order** in which you write up your methods of field investigation is also up to you. Here are some basic examples of acceptable ways to order your methods. These are just examples and it is entirely **your choice** how you write up your data collection approach, for both primary and secondary data.

Example 1 - Technique order:

- Technique 1: Pedestrian count
    - Justification
    - Problems
    - Links to hypotheses
    - Links to main enquiry

- Technique 2: Interview
    - Justification
    - Problems
    - Links to hypotheses
    - Links to main enquiry

Example 2 - Hypothesis/ sub-question order:

- Hypothesis 1: There are more people in place A than place B
    - Techniques used: *traffic count, pedestrian count etc.*
    - Justification for each technique
    - Problems
    - Link to hypothesis
    - Links to main enquiry

- Hypothesis 2: The people in place A are wealthier than place B
  - Techniques used: *Interviews, affluence census data, building survey etc.*
  - Justification for each technique
  - Problems
  - Link to hypothesis
  - Links to main enquiry