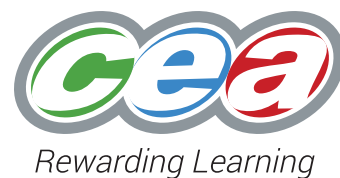


GCE



GCE
Nutrition and
Food Science

Teacher and Student
Guidance
A2 2: Research Project

Revised September 2022

Contents

	Page
Planning the research project	1
Carrying out the investigation	3
Writing up the report	6
Appendix 1: Ethics checklist	10
Appendix 2: The use of references in written work	11
Appendix 3: Presenting tables and figures	13
Appendix 4: Presenting a bibliography	14
Appendix 5: Writing an abstract	15
Student Summary Checklist	16

Planning the research project

Planning and time management

It takes time to complete a good piece of research. A common mistake is to underestimate how long it will take to carry out both secondary and primary research. It is unlikely that you will be able to keep rigidly to a timetable but some attempt should be made to devise a schedule or timeline for data collection, analysis and report writing.

Developing the working title

Begin by identifying an area of study which appeals to you. It could be an area of interest or one that you are considering for a career or a course you would like to study at university. Select a broad topic to begin with, but it needs to be refined to a narrow, focused area for research. If you have several ideas, look at the secondary research available and talk to your teacher to help you decide.

- check the proposed area of study matches the specification
- carry out some exploratory reading
- discuss the topic with your teacher to gain additional insights and begin to develop the research problem

The research problem should:

- be clear and understandable to you and others
- be achievable and capable of developing into a manageable research project so that data may be collected in relation to it
- take time and resources into consideration
- focus on a specific group or locality
- connect with existing theory and research
- be neither too broad nor too narrow
- take ethical issues into account using the checklist provided in Appendix 1

Avoid vague and wide titles such as *Food Waste*. You need to have a more clearly defined focus, for example, *Investigation of the factors implicated in Consumer Food Waste*. You may find it easier to formulate the title by writing it as a question. This can help to ensure you adopt an investigative approach to your research project. For example, *Veterinary medicines – a cause for consumer concern?*

Developing the aim

Writing the aim helps to focus the direction of your work. An aim is a statement which identifies what the research project hopes to achieve. It clarifies the title and outlines the angle the research will take.

For example:

- *To determine the potential factors influencing consumer food waste in the home*
- *Concerns regarding veterinary medicine* is too broad while *To establish if antibiotic use in animals impacts the food choices made by consumers*

An **aim** generally begins with a verb, for example:

- to explore...
- to identify...
- to establish...
- to determine...
- to investigate...

The **objective** will identify the most appropriate way of achieving your aim and specify the primary research that you will undertake, for example:

- research the range of Fairtrade products in a large supermarket; or
- create a questionnaire to establish consumer attitudes to Fairtrade products

Drafting the introduction

The introduction is a brief explanation of the rationale for the chosen research area. It should:

- provide a background and context to the project such as statistical evidence, current trends or changes to government legislation
- discuss the research problem and include well-argued reasons for your project
- provide direction for the research
- show evidence of your own thinking
- draw attention to the limitations or parameters of the research
- explain how ethical considerations have been addressed

The introduction is written as a rough draft at the start of the research process. It is then finalised at a later date to ensure it covers exactly what happened and to allow for changes which may have occurred as the research progresses.

Literature Review

Research involves reading what other people e.g., researchers, government reports, and agencies have written about your chosen research area. You will need to provide evidence that you have read a wide range of relevant literature and that you have a sound understanding of the current state of knowledge on the subject.

- review should be relevant to the selected research area and focused on the target group
- consider how the literature relates to the aim of your investigation
- avoid a descriptive review but engage with the reading, commenting on it, showing your understanding of the material
- consider the date of the literature you are reading as sources of information should be current
- examine the sources critically before deciding to use them; be aware of any bias, or possible slant which affects the way material is presented and ask yourself if you are able to trust the author's judgements

You must select, organise and produce a review of your findings in a succinct, relevant and coherent manner. Use a range of sources to demonstrate a good understanding of existing research and avoid over dependency on one form of material. Issues identified at this stage should help you to design the primary research tool. Remember to record all the reference details to collate the bibliography. A reference is required in the text whenever you refer to the work of another author. Guidance on Harvard referencing can be found in Appendix 2.

Secondary source material you may wish to use at this stage includes: online resources, books, journal articles, key documents such as government reports and publicity materials from organisations.

Carrying out the investigation

Collecting Data

Select and justify the most appropriate research method e.g., an interview, questionnaire. Plan the primary activity and the research procedures. You need to make a rough draft of all the planning decisions as these will form the methodology section of the report.

Include details relating to:

- who will be surveyed
- why they were selected
- how the participants were selected
- what information will be gathered
- where the survey will be conducted and under what conditions
- when the survey will take place

Questionnaire

Designing an effective questionnaire requires considerable skill. Do not underestimate the time and effort required to design, pilot, distribute and collect questionnaires.

Before designing your questionnaire, start by re-visiting the aim of your study. This will ensure you ask questions that are relevant and assist with achieving the aim.

Some issues to bear in mind include:

- **question type** – consider the different types of questions to include, for example open and closed. Remember that a structured question with a range of possible responses provided will be easier to analyse than questions eliciting an open response
- **question wording** – consider the language used, you will need several attempts at wording in order to remove ambiguity. The language used should be appropriate to the sample group, for example questions for school children will be different from questions designed for adults
- **question response** – questions which require only a ‘yes’ or ‘no’ response will not provide usable data. Leading questions and those which only test knowledge are to be avoided
- **validity and reliability of the questionnaire** – validity is the extent to which the research method, for example the questions, address the research aim, whereas reliability of the questionnaire refers to the consistency with which respondents understand and respond to questions
- **ethical considerations** – maintain strict ethical standards at all times; an ethics checklist is included in Appendix 1. Questions should never make judgements or make the respondent feel uncomfortable
- **appearance and layout** – make the layout clear with plenty of space around each question; and
- **length** – the number of questions should be sufficient to yield useful results and achieve the aim; a questionnaire that is too long or too brief may not provide data to meet the overall aim

Sampling

The next step is to decide on the sampling method that can be used to collect primary data from your target group. Sampling techniques include, for example random, opportunity, and systematic. In a small-scale project it will not be possible to achieve a true random sample, however, efforts should be made to select as representative a sample as possible. Opportunity samples are generally acceptable as long as the make-up of the sample is clearly stated and the limitations of the data are realised.

Piloting the questionnaire

- it is important to give the questionnaire a trial run
- this pilot will test the validity and reliability of the questionnaire
- ideally, it should be tried out on a group similar to the population of your study and usually 10% of the final sample
- your teacher can also take part in the pilot study and can provide you with valuable feedback
- assess the results from the pilot questionnaire and make appropriate changes to the final questionnaire

Distribution and return of final questionnaires

You will need to make a decision about how to distribute the final questionnaires and how they will be returned. Some issues to bear in mind include:

- procedures used should consider the collection of valid and reliable data
- obtain necessary approval before distributing the questionnaires, for example, from the head teacher or manager of a centre or supermarket
- consider the range of distribution methods available - the most effective method is to give questionnaires to respondents personally so they can be completed on the spot and returned immediately
- try to ensure anonymity
- make specific arrangements for collection of questionnaires taking account of any previous assurances of anonymity
- a clean copy of the final questionnaire should be included in the appendix

Recording of data

- all the raw data taken from questionnaires needs to be collated and recorded
- collate the results and record in table form, in preparation for analysis. Where appropriate express findings as a percentage
- include all tabulated results in the appendices
- raw data should not be included in the report or in the appendices

Interviews

Collecting valid and reliable information through interviews is time consuming, but useful where the target group is small. Interviewing involves:

- identifying respondents and deciding who and how many you will interview
- planning where you will conduct the interviews and under what conditions
- drafting questions and piloting them to identify problems
- producing an interview script
- arranging and conducting the interviews
- transcribing or recording responses in preparation for analysis

An unstructured or open interview can be useful but requires a great deal of time. However, a structured interview may prevent sensitive, unanticipated information being revealed. All copies of letters and communication should be recorded in the appendices. Findings from any interviews should be summarised and included in the appendices.

Writing up the report

Presenting the report

- the word processed report should be written in the third person and passive voice. For example, statements such as *in the opinion of the author ...*, *it cannot be assured that ...*, *taking account of the findings from the survey...* should be used rather than *I think I will...*
- the text should be on one side of A4 paper only
- the text should be font size 12 and the pages numbered
- the word count must be stated for each section
- the report should be submitted in a securely bound A4 folder
- ring binders or poly-pockets, because of their bulk, are not an acceptable form of binding
- the word limit for the report is 4000 words, not including the appendices and referencing of secondary sources. A tolerance of + or – 10% will be accepted
- 4 marks will be accredited for the quality of written communication, appropriate style of writing, appropriate vocabulary, adherence to word limit, accurate referencing and the inclusion of an accurate Harvard style bibliography

The following guidance is provided to help structure the report and achieve the 4000 word limit.

The headings to be used for structuring the report are:

Title

Abstract (approx. 150 words)

Introduction (approx. 350 words)

Literature review (approx. 1000 words)

Methodology (approx. 700 words)

Results and discussion (approx. 1500 words)

Conclusions (approx. 150 words)

Recommendations (approx. 150 words)

Bibliography

Appendices

Title

The title should be focused and clearly identify the precise nature of the research undertaken. It should be similar to the overall aim and reflect the content of the report.

Abstract

This is a summary of what the research set out to do, the methods employed and what conclusions were reached. An abstract is very brief, usually no longer than a paragraph and is generally written when the research has been completed. It is similar to the brief overview you find on the back of a novel. Get into the habit of looking at abstracts which are usually placed at the beginning of journal articles. Ask yourself whether they give a good idea of what the article is about, how data was collected and what conclusions were reached. You should refer to Appendix 5 for an example of one way to approach this task. This will be the final task in writing up the report.

Introduction

This is where you provide

- a rationale for the chosen topic or research problem
- discuss the research problem
- apply your own thinking
- explain the direction of the study
- recognise any possible limitations and ethical considerations
- aim and objective should be clearly stated at the end and the introduction should clearly show how they have been arrived at

Literature Review

This should be a clearly referenced critical review of the information gained from secondary sources displaying

- ability to select and organise findings relevant to the aim in a succinct and coherent manner
- consistent focus on the target group
- your sound understanding and application of knowledge
- your own thinking to show interpretation of the literature

Methodology

This is a clear, succinct explanation of the research procedures:

- it should be written in the past tense and the third person
- justify your choice of research method and sampling technique
- discuss any factors which may have affected the reliability and validity of the data collected
- explain how you attempted to work as ethically as possible
- indicate precisely how the research was conducted

Discuss how you carried out a pilot study and describe precisely how this was done:

- indicate how you distributed and collected the questionnaires
- highlight the main changes to the questionnaire as a result of the pilot

Describe the procedures for conducting the final survey:

- include how you distributed and collected the final questionnaires
- discuss any issues you considered such as, approval for distribution, and anonymity
- ensure procedures are sufficiently detailed to allow for replication
- recognise the response rate

Results and Discussion

This section is the heart of the report and should consist of text interspersed with at least 2 tables or figures.

Only the most significant results should be included in this section of the report.

- you must interpret, analyse and evaluate your findings not merely describe them. The text should not duplicate information in the tables and figures, but interpret it
- analyse what the results tell you and discuss how or why you think they occurred
- reflect on how the results affect existing knowledge. Do your findings support or conflict with other research in this field?
- comparisons should be drawn with relevant secondary research highlighted in the literature review section

Figures or tables

- should illustrate and illuminate the text. If they don't then there is no point in including them
- accompanying text should not duplicate information in the tables and figures, but rather interpret it
- should highlight the most significant aspects of the findings so that all relevant facts are presented in a way that draws the reader's attention to what is most important

All figures and tables within the text should be numbered in sequence and given titles to reflect what is being presented. Details of presenting tables and figures are provided in Appendix 3.

Conclusions

This section should

- refer back to the original aim
- summarise the main conclusions of the research
- be drawn from the primary evidence gathered in your study not from the secondary research
- be accurate and clearly expressed

Recommendations

- you may suggest a different or possibly more appropriate approach to the study
- recommend how you would progress your research project if you were to continue from the point at which you stopped
- suggestions you make for further research should be relevant to your work carried out so far and be realistic

Bibliography

This is a list of all the sources used for information. This should include any text which you have looked at – the extent to which they have been used is not important. Even if you have only looked at a text for ideas it should be listed. The bibliography should be written using the Harvard style which is explained in Appendix 4. Alternatively, a bibliography can be automatically generated by using the Microsoft 'References' tab.

Appendices

This section should include:

- tabulated results, collated data as percentages
- the final amended questionnaire or an interview schedule/script and an example of letters written and received

Appendix 1 Ethics Checklist

Before gathering any data, you should consider the following questions. If any of your answers raise ethical issues, you should consult your teacher and decide what actions to take.

- 1** Are the participants likely to suffer any threats to their well-being, health, values or dignity?
- 2** Are any of the participants unable to give informed consent for themselves? For example, they may be very young, unable to understand, elderly people or mentally ill.
- 3** Has the approval of appropriate authorities been sought?
- 4** Have anonymity arrangements been made?
- 5** Have participants been asked about medical conditions or any other features that might create a risk for them when participating in the investigation?
- 6** Does the study involve any invasion of privacy?

Appendix 2 The use of references in written work

A reference is required in the text whenever you refer to the work of another author. There are three major reasons for using references.

- 1 It is a mark of intellectual honesty. You must not claim other research as your own.
- 2 It is a means of defence; any errors in what is being said revert to the original author and not to yourself.
- 3 It provides the reader with the means of consulting the original work from which the thoughts or findings emanate.

There are a variety of methods of referencing literature for assignments. You should use the Harvard referencing system for all coursework. This is also known as the 'Author Date' system and is used in many journals. The one big advantage of this system is convenience for the author because as references are unnumbered they can easily be deleted or added.

The details of all references used in your report should appear in the bibliography. Examples of how to use the Harvard referencing system can be found in many textbooks and on university websites. You will save yourself much time and effort if you keep a record of the details of all the references you have used at the time when you read and make notes.

Writing references in the body of the text

In the body of the text, at the point where you wish to make the reference, put the author name(s) and the date of publication in brackets, e.g. (Gallagher, 2021). If there are two authors, give the surnames of each, e.g. (Hetherington and Maguire, 2008). If there are three or more authors, give the first author's surname and use the "et al" for the others, e.g. (Willett et al, 2019). Where the name of the author appears as part of the sentence, give only the date of the publication in brackets, e.g. Johnston, (2019) reports that ...

If there is more than one reference by the same author in a particular year then use a letter, e.g. Springmann et al (2018a). Where a number of authors are referred to in relation to one point, list them chronologically, e.g. Elliot (2008), Wilson (2013), Middleton (2013) agreed that the mental health of adolescents in Northern Ireland has been influenced by exposure to violence.

When referring to an online source use the following format:

- identify the author of the website (person, organisation or company)
- include the date of publication

Do not insert the URL (web address) in the body of the text.

e.g. The World Health Organisation estimates a third of all women at reproductive age are anaemic (WHO, 2021)

Quotations

If you present a direct quote, that is, the use of exactly the same words as the author in your text then you must:

- use double quotation marks; and
- give the author, year and page number(s) in brackets at the end of the quote, e.g. “consumption of breakfast cereal has been positively related to calcium intakes in girls” (Crawley, 2013 p.205).

Appendix 3 Presenting tables and figures

Presenting Tables and Figures

1. Tables

Table 1 Results of (second) validation survey

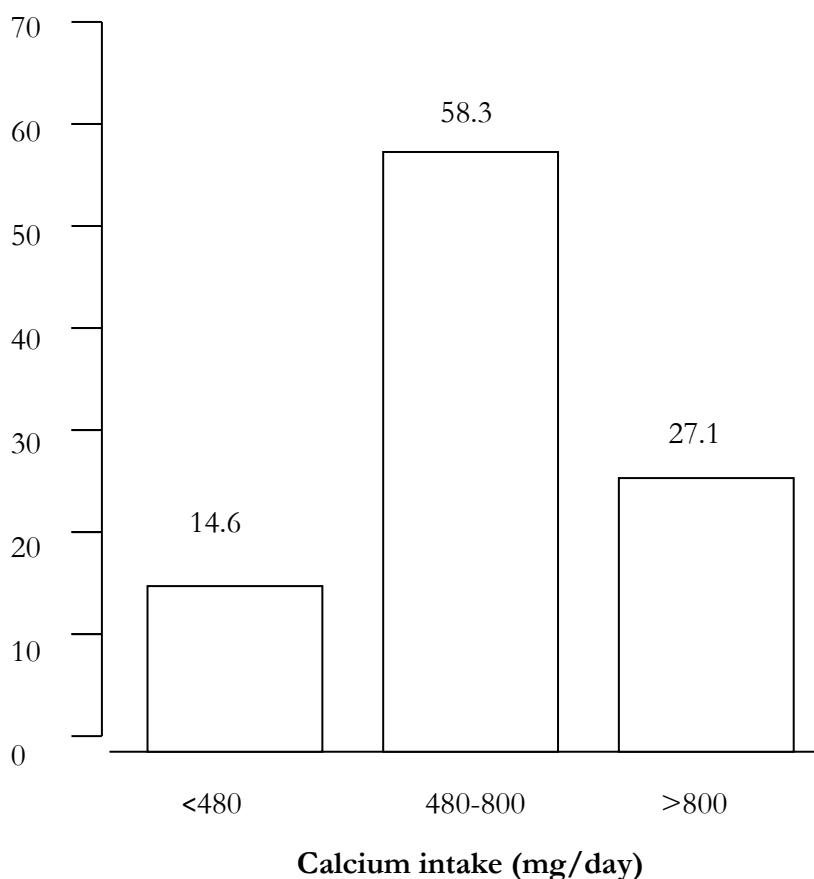
Nutrient	Daily mean	EAR ^a
Calcium	692.9mg	625mg
Energy	1719.5 kcals	1845 kcals
Vitamin D	2.16 μ g	0

Note: ^aEAR = estimated average required – for a population of 11-14 year old females.

2. Figures

Figure 3 Calcium intakes calculated from third survey food and drink diaries

Percentage



Notes: RNI = 800mg/d LRNI = 480mg/d

Appendix 4 Presenting a bibliography

The bibliography must be at the end of your work, but before any appendices. Always give it a clear heading and make sure you present a list of all the references which have appeared in your text. The publications should be listed in alphabetical order according to the authors' surnames. Books and reference journals should not be subdivided in your list.

Listing a reference to a book

Use the following format:

Author(s) Surname(s), INITIALS. (year of publication) *Title of book*. Edition. Place of publication: Publisher.

e.g. Jones, A (2021) *One: Pot, Pan, Planet - A greener way to cook for you, your family and the planet*. HarperCollins.

Academic and Professional Reference

When listing an article from a journal use the following format:

Author(s) Surname(s), Initials. (year) Title of article. *Title of Journal*, volume number, page number(s).

e.g. Buttriss, J.L, Lanham-New, S.A. (2022) *Vitamin D: One Hundred Years On* Nutrition Bulletin, 47, and 282-287

Web Links

When referencing a web page with an author use the following format:

Author's Surname, INITIALS, Year. *Title*. Edition (if not the first) Place of publication: Publisher. Available from: URL [Accessed Date].

e.g. Black, S. (2012) *Book title*. London: Pan. Available from: www.websiteaddresshere.org.uk/information [Accessed 2 February 2016]

When referencing a web page with an organisation as author use the following format:

Name of organisation (Year of publication) *Title of web page*. Place of publication: Publisher. Available from:URL [Accessed Date].

e.g. World Health Organisation (2021) *Anaemia*, Geneva: World Health Organisation. Available from: www.who.int/health-topics/anaemia (Accessed 4 February 2021)

Listing articles from newspapers and magazines

These articles can be referenced using the following format:

Author's Surname, INITIALS. (or Newspaper Title) (Year of publication) *Title of article*. Title of Newspaper, day and month, page number(s).

e.g. Scutt,H. (2022) *Ethical food choices will determine Earth's future*. The Guardian, 5 September, 2022.

Appendix 5 Writing an abstract

An abstract is a very brief summary of what the research set out to do, the methods employed and what conclusions were reached. It is generally written when the research has been completed. Below is an example of one way to approach the task:

Abstract (160 words)

This research report sets out to investigate food insecurity within family life and how it can pose a problem for families. This report gathered primary information from families through an anonymous questionnaire given out within a local food bank and charity organisation to gather key data about food consumption, food skills and the health implications of food insecurity.

The research examined the impact of food affordability, accessibility, availability and adequacy. Findings showed that shockingly 69% of respondents suffer from food insecurity, with half of those, suffering moderate food insecurity - compromising quality and variety of foods and skipping meals. Families who experience food insecurity found that it had a major impact on their food habits alongside physical and mental health as 59% of respondents stated they had skipped meals due to financial reasons and 68% agreed that food insecurity had impacted their own or a family member's mental health suggesting that food insecurity can create problems for families.

STUDENT SUMMARY CHECKLIST

Section	Summary points	Approx. word count	Maximum marks available
Title	Clearly identifies the precise nature of the research undertaken.		
Abstract	Concisely summarises the entire report and the research undertaken.	150	8
Introduction	Identifies the research problem, shows an argued rationale, explains the direction of the study, provides evidence of student's own thinking and recognises research limitations. Finishes with a succinct aim and objective.	350	12
Literature Review	Critically reviews and references what others have written on the topic. The focus should be consistent on the target group. Sources should be up to date and relevant. Provides evidence of student's own thinking to show understanding.	1000	24
Methodology	Describes all research procedures undertaken. Justifies the data collection method selected. Includes sampling method used, the chosen target group, the main changes to the questionnaire after piloting, and considers ethics. The validity and reliability of the research and the response rate should be discussed.	700	12
Research tool	Final research tool should be clearly presented in the appendices.		12
Presentation of Results	All results should be presented in percentages in the appendices. Results included within the text should be clear, appropriate and labelled as per appendix.		8
Discussion of Results	Includes interpretation, discussion and analysis of the findings from the primary research and highlights the similarities to and differences from the secondary research where possible.	1500	24
Conclusions	Draws together the key findings from primary research and reflects on the original aim of the project.	150	8
Recommendations	Recommends how to progress the study further. Suggestions should be relevant to the current study and be realistic. May suggest a different or possibly more appropriate approach to the study.	150	8
Presentation	Up to 4 marks available for adhering to word limit, referencing correctly throughout the project and including an accurate bibliography.		4
Total Report	The report, including bibliography, final questionnaire and appendices should be securely bound.	4000	120