Cambridge Assessment International Education

Coursework Handbook

Cambridge O Level

Geography 2217

For examination from 2020

Version 1

Cambridge Pathway

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Contents

Introduction

This handbook is a guide to the coursework component of the Cambridge O Level Geography 2217 syllabus.

The purpose of this handbook is to:

- offer advice on the requirements of the coursework
- provide examples of learners' work
- offer guidance on course planning.

How to use this handbook

- Section 1 outlines the requirements of the coursework component.
- Section 2 gives advice on delivering the coursework. It includes advice on timing, topics and guidance to give to learners.
- Section 3 explains the mark scheme and how to apply it.
- Section 4 advice on internal standardisation and moderation and explains the administrative procedures.
- The appendices include marked assignments with examiner comments.

Resources available from Cambridge

School Support Hub
This is our secure online support platform for Cambridge teachers. You can obtain a password and username to access it from your Examinations Officer. There are many resources on this site including the latest syllabuses, example learner responses, schemes of work, past papers and suggested textbooks.
www.cambridgeinternational.org/support

Training
Cambridge regularly offers training for O Level Geography, both in the UK and in other parts of the world. Details of future training can be found via www.cambridgeinternational.org/events.

Moderators' reports
For each examination series moderators produce two types of report.

(1) An individual report to each Centre about their learners' coursework and the Centre's marking.
(2) A general report to all Centres. This describes good practice and offers general advice to Centres.

Section 1: Requirements of the syllabus

The coursework requirements are outlined in the syllabus and repeated below:

- learners must submit **one** coursework assignment, which is set by the centre
- assignments can be based on any of the themes, or a combination of them, from the content of the syllabus
- the length of the assignment should be **up to 2000** words.

1.1. Levels of achievement

Marks for each assignment are allocated according to the mark scheme published in the syllabus. The indicators of each level are emboldened in the syllabus, and are used as the standard for all coursework assignments.

1.2 Principles to consider

Positive achievement

Each assignment should be designed to give all learners with the opportunity to show what they know, understand and can complete. This requires tasks that encourage all learners, whatever their ability, to attempt.

Differentiation

Your learners can undertake a common assignment following your instructions. However it is essential to be able to differentiate between them. This can be achieved by developing tasks which allow different levels of response or which have different levels of demand.

Teacher guidance

You are required to set the coursework tasks for all of your learners, therefore appropriate guidance is an essential component of coursework.

Appropriate guidance includes:

- outlining the purpose and aims of the assignment
- teaching the relevant geographical concepts and possible data presentation techniques
- discussion and instruction of the data collection methods
- ensuring a clear understanding of the structure of assignment.

The extent of your guidance may vary between assignments and some learners may require more specific support. The outline proposal submitted to Cambridge International often makes an excellent basis for this guidance.

Learner initiative

Learners need the opportunity to show initiative and individual choice. The most able learners are expected to demonstrate initiative and collect information beyond the common tasks set by their teachers. This can often be achieved by suggesting a number of hypotheses from which all learners select one or two. Learners can then be allowed to devise a further hypothesis of their own. This is explained in further detail in the rest of this section.

Assignment structure

All assignments should follow ‘the route to enquiry’ framework. This provides a structure to enable your learners to fulfil all the assessment criteria and understand the mark allocation.

1.3 Choice of assignment topics

One of the advantages of coursework is that it provides the opportunity for your learners to reinforce their understanding of geographical concepts. Therefore the choice of topic should aim to provide a case study and detailed information about a specific part or parts of the syllabus.

The topic you choose must depend upon available locations. The assignment should be realistic in terms of the number and complexity of tasks and the amount of data collected.

The most successful investigations are based on one of the following:

- an issue or problem which has a geographical dimension, in that it affects people and the environment e.g. ‘the impact of the expansion of an airport’
- an assertion which can be applied to a real situation, e.g. ‘national weather charts are of limited value when applied to local weather conditions’
- a theoretical geographical statement which can be investigated in a real situation, e.g. ‘the CBD of town X has typical characteristics or ‘the characteristics of the bedload of river Y changes downstream’.

These broad titles should then be broken down into specific and focused key questions or hypotheses. You may provide your learners with a set of statements to select from. By discussing in groups or working individually, they should devise one further question or hypothesis of their own.

1.4 Setting up the coursework

Every assignment requires a structure to enable your learners to complete the coursework successfully. The accepted framework is outlined as ‘the route to enquiry’ which is given in the syllabus and on the following page with additional comments.

The route to geographical enquiry		Additional comments
1 Identification of issue, question, problem	A topic for investigation is recognised through observation, discussion, reading or previous study. The design of hypotheses to test the issue, question or problem.	Topic usually chosen by teachers. At all stages there should be opportunities for learners to show initiative.
2 Objectives of the study are defined	The objectives of the study are defined in specific terms. Decisions are made concerning: a) what data is relevant to the study b) how the data can be collected.	A set of suitable questions or hypotheses is produced by teachers. Learners select from these and suggest a further question devised by themselves.
3 Collection of data	Learners carry out a group or individual set of tasks which may include fieldwork to collect primary data such as undertaking questionnaires, mapping or sketching observation, recording counts or measurements. It may also involve gathering data from secondary sources such as from Census information, the internet, published maps, books, newspapers or magazines.	As a general rule, one source of data collection does not provide sufficient variety to achieve Level 3 quality.
4 Selection and collation of data	You may collate data for class use. Learners select data to develop the aims or hypotheses for the topic.	Further secondary data may be added to support data collected.
5 Presentation and recording of the results	Learners individually record results and represent findings in an appropriate form using a variety of maps, graphs, etc.	It can be limiting if just one or two techniques are used. Simple statistical tests may be used.
6. Analysis and interpretation	Learners individually analyse and interpret their findings in response to the issue / question / problem with reference to relevant geographical concepts.	Analysis and interpretation may include patterns, trends, anomalies or identification of points not immediately obvious from the results. It is good practice for learners to integrate their data analysis and interpretations of the data with the presentation of their results.
7 Making effective conclusions, evaluation and suggestions for further work	Learners individually draw conclusions from their findings and make evaluations related to the original objectives. If appropriate, comments may be made on the limitations of the data and possibilities for further study.	Conclusions summarise findings and key evidence in support. Evaluation may include comments with the benefit of hindsight, identification of people or groups who would find the results useful or suggestions for further lines of enquiry.

Once a decision has been made about the topic for investigation (and a suitable location found) the hypotheses should be devised. These are specific statements that can be investigated by your learners using primary or, but not exclusively, secondary data.

Decisions also need to be made about:

- data collection methods
- sampling procedures
- practical considerations of undertaking the coursework.

The extent of involvement of learners in this decision-making varies between schools but the most successful coursework often involves some judgements by them. However you must make sure that sufficient and appropriate data is collected. More questionnaires for instance can usually be collected as part of an organised collaborative effort by your learners. This not only means that there is more data to represent graphically, but also greater validity should it be decided that statistical testing is appropriate.

Below are some examples of appropriate assignments by way of illustration.

Assignment Example 1: An issue
Chosen topic for investigation 'The impact of cruise ships on town X'
Knowledge with understanding Possible hypotheses of varying complexity • 'The cruise ships increase the litter in the CBD' • 'The cruise ships increase the number of people in the CBD' • 'The number of people decreases with distance from the harbour' • 'The cruise ships have an adverse effect on the CBD environment' Learners will select one or more of the hypotheses and should devise an additional statement.
Primary data collection This will take place on two occasions when different numbers of cruise ships are visiting the town. Data collection methods include an environmental survey using a scoring system with a range of variables, several pedestrian counts and possibly a questionnaire to residents. Secondary supporting data should include information about cruise ships, population statistics, CBD characteristics and the growth of tourism. More able learners could make decisions on variables with the environmental survey, design the questionnaire (or at least one or two questions), make additional observations and devise a different hypothesis.
Data presentation A range of data presentation techniques will be used including simple bar graphs, rose diagrams of environmental quality plotted on a map, pictographs, flow diagrams and isoline maps. Annotated photographs will also be encouraged. More able learners will be expected to show initiative and individual flair in their presentation techniques.
Data analysis and interpretation The analysis of each graph will describe the pattern shown by the data and attempt to explain their findings.
Conclusions and evaluation The conclusion will link the data evidence to the hypotheses and an evaluation of the data collection methods will be included. This may incorporate improvements to the investigation and possible solutions to the effects of the cruise ships.

Assignment Example 2: An assertion
Chosen topic for investigation *'The river Y varies in depth, velocity and bedload with distance from the source'*
Knowledge with understanding Background of river Y drainage basin, land use of the area. Geographical concepts of hydrology concerned with depth, velocity and bedload. Choice and explanation of the hypotheses for example: • 'The velocity increases between Site 1 and 6' • 'The cross sectional area increase from Site 1 to 6' • 'The bedload becomes rounder and smaller from Site 1 to Site 6' • 'The higher velocities are found in areas of deeper water' Other statements could link the changes in size or shape of bedload with river depth or velocity.
Primary data collection At least 6 sites (given the constraints of safety) will be sampled at differing distances from the source. There should be sufficient variation in depth and velocity. At each site the depth of the river is measured at intervals across the width. The speed is calculated using a floating object. The bedload is sampled. More able learners could make observations of the land use or river features or valley slope angle depending upon their choice of hypotheses.
Data presentation Cross sections should be drawn for each site and also graphs to show the changing velocity and bedload size or shape. Scatter graphs and flow graphs could be represented on maps of the area. More able learners will be expected to show initiative and individual flair in their presentation techniques.
Data analysis and interpretation Learners will describe the patterns shown in the data clearly and concisely and attempt to explain them using their geographical understanding. Statistical analysis using Spearman's rank correlation could be carried out.
Conclusions and evaluation Learners will link their findings to the hypothesis statements quoting data evidence to support their decisions. The data collection methods should be critiqued and the limitations of the data noted with possible improvements to the investigation if it were repeated.

Assignment Example 3: An geographical statement
Chosen topic for investigation *'There is a shopping hierarchy in Town Z'*
Knowledge with understanding Learners should include background information on the location of the town and the shopping areas selected. This should include explanations of hierarchy, sphere of influence, range, convenience and comparison goods and their understanding of the hypotheses. • *'There are more convenience shops at shopping centre A than B'* • *'The sphere of influence is larger at shopping centre B than A'* • *'More shoppers will travel by car and buy high order goods at centre B than A'* Learners may select one or two hypotheses, and devise one of their own statements.
Primary data collection A number of different methods could be used including a land use survey and questionnaires. Other possible tasks are a pedestrian count, car parking survey, traffic count or variations in prices of selected items.
Data presentation A range of opportunities for different methods including bar and divided circle graphs, pictographs, land use maps and sphere of influence maps. More able learners will be expected to show initiative and individual flair in their presentation techniques.
Data analysis and interpretation The depth of analysis will depend upon the complexity of the chosen hypotheses. Consideration should also be made to the time of day and day of the week of the data collection. Statistical testing of the questionnaire data could be considered.
Conclusions and evaluation The concluding comments should include reference to the hypotheses using data evidence to support any decisions made. Learners should critically evaluate the data collection methods of the investigation and suggest ways to improve future tasks. The learners may also like to consider the best location for a specific shop/service and justify their decision the light of their findings.

1.5 The role of Cambridge International

Advice on specific coursework assignments is readily available from Cambridge International. It is a requirement of the syllabus that schools submit their coursework proposals for consideration (info@cambridgeinternational.org). This ensures an appropriate route to enquiry is followed and that the topic is suitable.

A coursework assignment proposal should include:

- a title for the investigation, the broad aim and examples of specific hypotheses / key questions to be investigated
- the specific types of primary data to be collected by your learners and details concerning the methods of collection. Estimates of the number of sites e.g. for river studies or the amount of data e.g. for questionnaires, should be included. Opportunities for differentiation in data collection should be outlined. Types and sources of secondary data should also be included
- other information concerning the nature of the investigation, sources of additional information or practical details of the assignment.

An example of a coursework proposal is given on the following page.

Example of a coursework proposal
An investigation related to syllabus theme 1.2 Settlement: *'Is there a pattern to the distribution of rural settlements in Area X and the types of services they offer?'*
1. Identification of the problem. Definition of the area to be studied Relationship to concepts studied for 1.2 of the syllabus - in particular, site, situation and functions of small settlements and services in relation to settlements, e.g. threshold, range of a service. Learners will select hypotheses from the following list and devise one additional statement: • 'Larger settlements will have a higher number of services' • 'Residents travel further to obtain high level goods' • 'Services in smaller settlements serve the local community' • 'The number of services in smaller settlements has decreased recently'
2. Objectives of the study are defined The characteristics of each settlement – its site, situation, size, population, shops and other services, sphere of influence. How may each of these characteristics will be investigated? What data collection methods are appropriate? The role of map study, counts, observations, questionnaire layout and sampling techniques are discussed as a group and decisions made.
3. Fieldwork procedure – the methods of field investigation are outlined and carried out. The site and situation of the settlements are described by combining visual evidence recorded at each location with mapwork using a large-scale topographical map. The size of each settlement – a count of the number of inhabited and uninhabited houses. The population of each settlement calculated using an average head per household figure or secondary data found. Recordings are made of the numbers and types of services found in each settlement – shops, telephone boxes, post boxes, bus stops, etc. Learners encouraged to make individual, additional observations and to take photographs. Questionnaires for residents to identify spheres of influence. More able learners will devise three questions of their own to include in the group questionnaire. Estimated number of questionnaires will depend on size of each settlement; minimum 10 for smaller settlements, 30+ for larger ones.
4. Selection and collation of data Data produced in the field to be collated by the teacher but learners will select the data related to their chosen hypotheses.
5. Representation of results Drawing of maps to show settlement distribution, desire lines for certain services, graphs, etc. Learners will select appropriate graphs to present their results.
6. Analysis and conclusion This will be completed by learners individually following a suggested framework for each criterion and linking closely to the relevant geographical concepts and the stated original hypotheses.

Section 2: Delivering the coursework

2.1 Practical guidelines for delivering the coursework

When?

The length of the school day, organisation of the school year and practical considerations vary between schools, so you must decide when the assignment should be undertaken. There are advantages in completing coursework at the same time as teaching the relevant syllabus content in the classroom but this is not essential. Some schools complete a residential course, most use local opportunities near to the school.

How much time?

Time should be allocated for coursework preparation, data collection and follow up lessons to give learners sufficient supervised time and access to appropriate guidance from you. It is important for the time allocated for coursework to reflect the 27.5 per cent of total marks for the assignment.

How?

The common nature of the coursework tasks allows your learners to work in groups for data collection, although you should constantly encourage your most able learners to show their initiative beyond the set tasks. Any individual contributions need to be clearly stated in the learner's written report to allow credit to be awarded.

You can produce the data collection recording sheets, questionnaires or environmental survey sheets following a group discussion with your learners.

Successful data presentation relies on your learners being familiar with a range of appropriate techniques. If a range of appropriate methods are suggested then the choice is more individual and higher marks can be scored for individual flair.

The analysis, interpretation, conclusion and evaluation should be completed individually following initial essential guidance.

2.2 Health and safety issues with coursework

You need to be aware constantly of health and safety issues when undertaking coursework tasks. This should include conscious risk assessment of the data collection locations, weather conditions and potential river and coastal hazards. Urban fieldwork presents different risks which require identification by the teacher in charge. A preliminary visit to the data collection site is essential in assessing safety issues and practical arrangements should be clearly stated to all participating learners.

2.3 Guidance to learners

Each learner must be aware of the 'route to enquiry' framework to ensure they meet all of the assessment criteria. Your initial guidance needs to include the details of the overall aim of the assignment and the hypotheses to be tested. A reminder of the relevant geographical concepts is useful to enable the assignment to be placed in the context of the classroom teaching.

Some less able learners may need more individual guidance in their choice of graphs, analytical comments or conclusions. This is appropriate although the extent of your guidance should be reflected in the level of marks awarded. Initially these less able learners may respond to a series of questions to analyse their graphs, for example:

- What does this graph show?
- Which was the most popular mode of transport?
- Which was the least popular mode of transport?
- Why do you think most people came by car?

Similar questions could be asked to help your learners to structure their responses for the conclusion and evaluation.

More able learners will require different levels of guidance to gain the highest marks. These learners will need to be very aware of the level three indicators in the assessment criteria. To achieve marks at Level 3 learners need to:

- show initiative in data collection
- show individual flair in data presentation
- give enough detail in their introductions to set the investigation in its broader context
- use secondary information where relevant
- explain the hypotheses clearly using geographical terminology.

The writing up of the coursework

It is acceptable for you to prepare a written outline structure for each assignment for your learners to consult during the writing of their coursework assignment. The setting of deadline dates encourages continual progress. The route to enquiry framework helps the initial planning of the coursework report. You may annotate early drafts submitted for advice, but whether the advice is taken is the responsibility of the individual learner.

2.4 Plagiarism

Plagiarism is the act of presenting someone else's work or ideas as one's own. This might happen in a number of different ways:

- failing to acknowledge quotations and concepts
- using particular graphs, phrases or sentences from another author without giving them credit via inverted commas and a footnote
- writing something that is only very slightly different by altering a few words of another author's work
- buying a project from an internet site and presenting it as one's own
- downloading and pasting text or images from an internet site without acknowledgement
- getting somebody else to write all or part of one's own work.

It is the centre's responsibility to make sure all coursework is the original work of learners. You need to make clear the consequences of plagiarism, both at the outset of the course and at intervals thereafter.

Detection is normally easy since the language of a copied assignment will in general be more complex than that of the learner's own writing. It is also sometimes easy to use the internet to search for particular phrases to see whether they come from a website. Be aware that some learners may 'borrow' assignments from older siblings or friends.

There may, for example, be a lifted paragraph which sits oddly with the writing before and after it. Perhaps there is some uncharacteristically ambitious phrasing; a simple enquiry about the meaning of the phrase will settle doubts one way or the other.

To help prevent plagiarism, some of each assignment should be carried out in the classroom. If the first draft differs greatly from the plan, suspicion may be aroused. The writing of the first draft in the classroom might be the most secure form of supervision.

Your role in detecting plagiarism is crucial. If you have doubts about the authenticity of an assignment, it should not be submitted. The policy on dealing with malpractice can be found in the *Cambridge Handbook for Centres*.

2.5 Frequently Asked Questions about coursework

Question
English is not the first language of several learners – will they be penalised for spelling and grammatical errors?

Answer
We are assessing learners' geographical ability and therefore must make an assessment according to the assessment criteria. If a learner is unable to express arguments clearly, it may be possible to convey ideas by using diagrams, graphs or photographs. Teachers and moderators should reward positive achievement however expressed.

Question
What happens if a learner exceeds the word target for an assignment?

Answer
No mark penalty will be incurred. A reminder to stay within the recommended limit will be given. The word target is a guide and should encourage concise, analytical comment of relevant information. Learners who exceed this often over complicate their work which negatively affects their marks. Thinking how to be concise often improves clarity. Learners can be encouraged to annotate graphs to indicate the main patterns and to use sketches to show collection methods rather than writing descriptive prose. Conversely, if an assignment is too brief, then it is unlikely to give your learners adequate opportunity to demonstrate their full ability. Learners may be encouraged to write up their data collection methods in tabular form, but this still counts towards the word limit.

Question
Should teachers make allowances for the maturity of the learners?

Answer
No, the assignment must be marked according to the assessment criteria, with no allowances for learner maturity.

Question
Can all graphs and writing be completed using ICT skills?

Answer
Almost all learners now use computers to present the whole of their assignment. Although computers tend to improve the quality of presentations, it should be recognised that certain higher geographical techniques and graphs cannot easily be produced using software packages, e.g. choropleth maps, isoline maps or cartographic methods. Therefore ICT is not always the most appropriate method of presenting all parts of coursework assignments. However, appropriate and effective use of ICT can be rewarded.

Section 3: Assessing the coursework

3.1 Assessment of coursework

One of the features of O Level Geography assessment is to reward positive achievement rather than penalising errors i.e. to assess what learners know, understand and can do.

A learner's assignment is worth 27.5% of the Cambridge O Level Geography examination. It is therefore essential for teachers to design assignments which enable each learner to access the full range of marks in each assessment objective. The teacher assesses the assignment out of 60 marks and the allocation of marks reflects the weighting of the syllabus assessment objectives.

Assessment criterion		Marks allocated	Weighting
AO1: Knowledge with understanding		12	20%
AO2: Skills and analysis	Observation and collection of data	12	20%
	Organisation and presentation of data	12	20%
	Analysis	12	20%
AO3: Judgement and decision making (conclusion and evaluation)		12	20%
		Total: 60 marks	

3.2 Using the mark schemes

You must mark the work of each learner from a total of 60 marks with 12 marks allocated for each assessment criterion. The coursework assessment criteria can be found on pages 17 and 18. The key characteristics for each criterion and each level of achievement have been emboldened.

The mark schemes are arranged in three levels, these are arranged in ascending order so that each level describes a more assured performance than the one before it.

Read and annotate the work and then make a 'best fit' judgement as to which level to place it in. Very often you may see qualities that fit more than one level, so always use two levels at least and come to a decision between them. You can trade off the strengths and weaknesses in the work against the criteria in the different levels. Lastly give a specific mark from your chosen level.

If all the criteria in a level fit your judgement, award the highest mark and check the level above, just in case. If most of the criteria fit your judgement, award a mark nearer the bottom and check the level below, just in case.

When you assess all of your own centre's coursework assignments, place them in rank order, and award the marks accordingly, paying special attention to the borderlines. Try to differentiate between assignments that lie within the same level.

Be careful not to crowd too many of your learners on to a single mark, particularly the bottom mark of a level. The graph of your distribution of marks should be smooth rather than have points. Where a high number of learners are placed on one mark, an external moderator will rarely agree that the work of each is of the same quality.

You should complete an Individual Learner Record Card (ICRC) for each learner to show the breakdown of marks. Where internal moderation has been required, evidence of amended marking and any scaling (explained below) should be shown on the form. All learner marks must be recorded on the Coursework Assessment Summary Form (CAS) for submission to Cambridge. These forms and information relating to deadlines and the selection of the moderation sample are available on the Cambridge Samples Database at www.cambridgeinternational.org/samples. Simply enter your Centre number and the syllabus code to access all information.

3.3 Annotation

It is essential that there is proof of your judgement on every assignment. There should be a comment on the strengths and weaknesses at the end of each piece or section, and errors should be annotated in the body of the work or in the margin. This annotation is very important for the external moderation process because it helps to explain the mark that you have given. Annotation should clearly relate to the assessment criteria and should use phrases from the mark scheme. In addition, the Individual Learner Record Card has a space for a comment justifying the marks given for the complete portfolio. Please note that knowledge with understanding should be assessed over the whole study and not just on the introduction.

3.4 Coursework assessment criteria

Generic mark scheme for Coursework assessment

Assessment criterion	**Level 1 1-4 marks	Level 2 5-8 marks	Level 3 9-12 marks
Knowledge with understanding (within the context of teaching and guidance) (max 12 marks)	Describes information in **simple** geographical terms and shows a **tentative grasp** of the aims.	Outlines relevant information using **appropriate geographical terms** and **develops a clear** link between the aims and geographical ideas.	Provides **comprehensive** information with a **careful use of appropriate geographical terms** and the **aims are clearly related** to relevant key geographical ideas.
Skills and analysis • **Observation and collection of data** (max 12 marks)	Shows evidence of some ability to collect and record **basic information** from **limited sources** and shows evidence of **simple planning**.	Collects and records **relevant information** from **valid sources** with evidence of **sound planning**.	Collects and records **detailed data** from a **range of valid sources** within **a clear planning design**.
• **Organisation and presentation** (max 12 marks)	The presentation is **loosely ordered** and uses **one simple presentation technique appropriately**.	The presentation is **logically ordered** using **two or more presentation techniques appropriately and effectively.**	A **coherent presentation** using a **range of appropriate techniques** with **accuracy and clear relevance** to the aims.
• **Analysis and interpretation** (max 12 marks)	Makes **descriptive** and **simple** comments about the information.	Makes a number of **valid statements** about the data with **some explanations** attempted.	A **thorough interpretation** of the data with **reasoned explanations** and comments.
• **Conclusion and evaluation** (max 12 marks)	States **superficial conclusions** showing **tenuous** links to the original aims. **Simple evaluation** showing little awareness of any shortcomings.	States **tentative conclusions** linked to the original aims. Some judgements linked to information collected. **Some evaluation** of a limited range of weaknesses.	States **clear conclusions** in the light of the aims, clearly related to the evidence collected. Makes a **sound evaluation** identifying weaknesses and suggesting improvement.

** Level 0 (0 marks) is awarded for a criterion where there is no credit-worthy material.

Bold words are level indicators.

3.5 About marked examples of coursework

Three annotated assignments are included in this handbook in the appendices to help indicate the appropriate application of the assessment criteria. They were written by different learners from different schools.

It is suggested that you read through each assignment and familiarise yourself with the key level indicators of the mark scheme. The marks awarded for each assignment are outlined below.

Assignment 1	Investigating microclimatic variations around the global education city, Jeju Island, South Korea.
Assignment 2	How does the Lyne Water channel change with distance downstream?
Assignment 3	A study of Luxembourg city

Assessment of sample assignments

Assessment criterion	Assignment 1	Assignment 2	Assignment 3
Knowledge with understanding	11	8	8
Observation and the collection of data	11	11	8
Organisation and presentation	12	11	10
Analysis	12	8	9
Conclusions and evaluation	12	9	6
Total	58	47	41

Section 4: Coursework administration

4.1 Internal standardisation and moderation

If there is more than one teacher in your centre, it is important that you hold a standardisation meeting at the earliest opportunity. During this time all of the teachers in your centre should agree on the quality of specimens of work. The aim of this meeting is to check that all teachers are marking to the same standard before they go on and mark the remainder of the work.

At such a meeting there should be consideration of:

- the mark schemes
- three pieces of work that illustrate three different mark levels.

At the meeting there should be a discussion of the quality of the work. Each example should be assigned to a mark level and lastly, a mark should be decided. Exact agreement on the mark is unlikely, but there should be general agreement.

It is most important that there should be agreement on the rank order of the work considered at the meeting. It is very beneficial to hold similar meetings at intervals during the course. This saves time when the final internal moderation takes place.

4.2 The internal moderation meeting

This meeting is essential if there are two or more teaching sets entering learners from the centre and they have a different teacher.

The function of the meeting is to establish a single, reliable rank order for all learners in the centre and it must be held just before the marks are submitted to Cambridge International.

While it is possible for all teachers involved to meet for this purpose, it takes up a lot of staff time, and the process takes longer because different teachers have to see large numbers of coursework assignments and agree on the marks, which can take a great deal of discussion.

Your centre may therefore choose two teachers who are known to be reliable assessors, to meet to assess the marking of each set in turn. They must first of all agree on the marking of each other's learners.

They examine a sample from each of the other sets in turn. There should be ten coursework submissions in each sample, covering the range from the highest to the lowest mark. The marks may be approved, or judged to be consistently severely or generously marked, in which case the marks should be appropriately amended. It may be decided that marks only need to be amended in a particular range of the marking, for example the bottom third. Consistent marking allows moderators to amend severe or generous marking traits across all of a teacher's marking based on their judgement of a sample of the work, this is called 'scaling'.

If the moderating teachers are not sure how to adjust marks, they may ask to see more folders from a teaching set. Where the marking is inconsistent, they should try to work out why this has occurred and ask the teacher concerned to submit a new rank order.

Where marking is inconsistent, it is usually because one of the criteria in the mark schemes has been considered more important than the rest. Another common issue is when an unduly large number of learners have been given the same mark and it is impossible to agree that the work is of the same quality. This can usually be resolved by asking the teacher to redistribute the learners over a three or even four- mark range.

When the process is at an end, the Internal Moderator should make sure that all the amendments to the marks are recorded on the Coursework Assessment Summary (CAS) Form and that these are the final marks to be submitted to Cambridge International and to be recorded on the individual coursework submissions and the mark sheets.

4.3 The external moderation sample

External moderation is undertaken by Cambridge International to ensure the same standard is applied by all teachers in the assessment of coursework assignments.

Each school must select a representative sample of assignments and send these by the date specified in the *Cambridge Handbook*.

The sample should include the coursework submissions with the highest and the lowest marks and there should be an even distribution of marks across the whole range. Unless instructed otherwise, try to avoid sending too many submissions that have the same mark.

Each submission should be securely fixed together and there should be an Individual Candidate Record Card, filled in with all the details, on the front.

The sample should be accompanied by the Internal Moderator's copy of the Mark Sheet (MS1), the centre's Coursework Assessment Summary Form and the Individual Candidate Record Card(s).

All forms are available from the Cambridge Samples Database at www.cie.org.uk/samples. Simply enter your Centre number and the syllabus code and the database will provide a link to an electronic version of the forms, as well as information on the selection of moderation samples and any deadlines.

Your External Moderator will seek to approve your marks. Where your marks are amended, this will be to bring your marking into line with all centres entering the component.

Please check all details, deadlines and arrangements in the *Cambridge Handbook*.

Appendices

Example Assignment 1

Example Assignment 2

Example Assignment 3

Example Assignment 1

INVESTIGATING MICROCLIMATIC VARIATIONS AROUND THE GLOBAL EDUCATION CITY, JEJU ISLAND, SOUTH KOREA

TABLE OF CONTENTS

1

Comments

1 Accurate table of contents. Contributes to organisation and presentation.

IGCSE Geography Coursework - Microclimates

AIMS

1) To what extent does the Global Education City represent an urban heat island?
2) How and why do building developments in the Global Education City impact on wind direction and wind strength? 2

3

Comments

2 Aims clearly stated.

IGCSE Geography Coursework - Microclimates

LOCATION

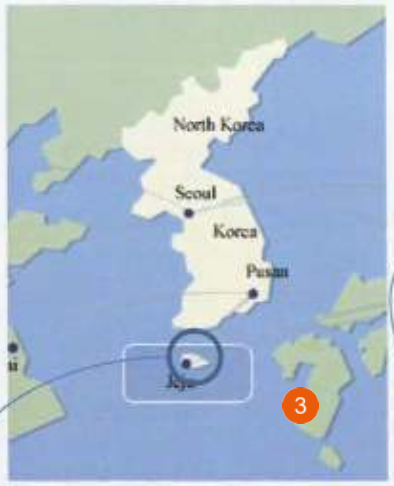


Figure 1.1 Location of Jeju Island

Jeju is located to the south of the Korean Peninsula

Figure 1.2 Location of Global Education City (GEC)

GEC is located at the Southwestern part of Jeju Island

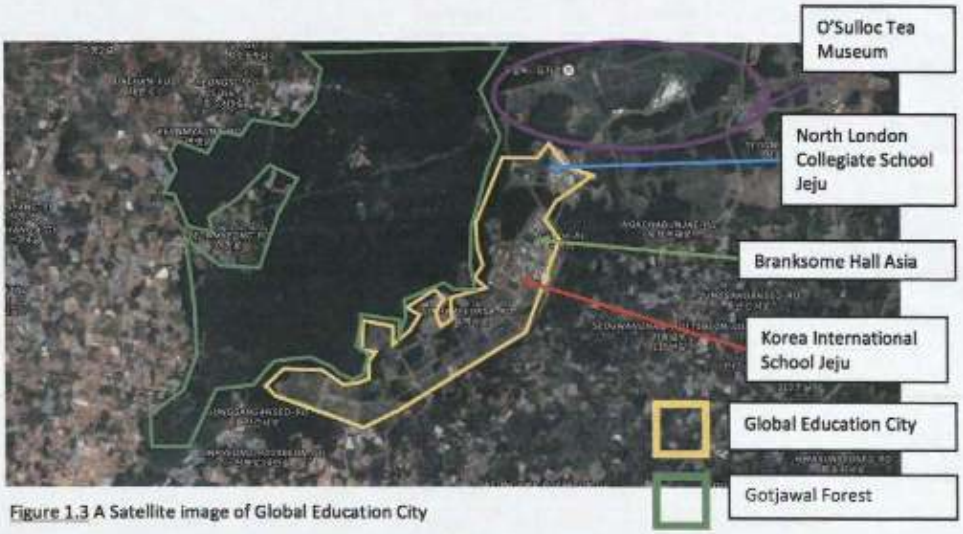


Figure 1.3 A Satellite image of Global Education City

4

Comments

3 The study area is clearly located, although maps do not have a scale. Despite this the learner is showing good use of IT by labelling the maps well.

IGCSE Geography Coursework - Microclimates

This investigation is taking place in the Global Education City (GEC), Jeju Island, Republic of Korea. GEC is a project conducted by Jeju Free International City Development Center (JDC). In GEC, there are several developments that have taken place, such as international schools, residential complexes and commercial districts. The land is used to build a lot of low-altitude buildings and grid road systems. The area around the GEC is a rural area. To the Northwest of GEC is a Gotjawal Forest[1]; to the North is a tea museum "O'Sulloc"; to the South and East is a farmland. This area is a good location to study microclimate because we are able to study urban microclimates and rural microclimates in and around GEC. This makes it easier for us to compare and contrast the microclimate in urban and rural area.

4

[1] "A naturally formed forest located on the middle slopes of Halla Mountain, Jeju Island, South Korea" – A Forest Without Winter - Part 1, Arirang TV (December 1, 2008)

5

Comments

4 Concise background and site information. There is some justification for the choice of sites.

BACKGROUND INFORMATION

Microclimate is the climate of a very small or restricted area, especially when this differs from the climate of the surrounding area.[1]

The surface temperature varies in different microclimates because of several reasons. In urban microclimates, urban heat island is created. The urban heat island is an urban area which is significantly warmer than its surroundings due to albedo and specific heat capacity levels. Albedo is the percentage reflection off solar radiation of the surface and specific heat capacity is the amount of energy required to raise a surface temperature by 1°C. According to the EPA, many cities have air temperatures up to 5.6°C warmer than the surrounding natural area. In urban microclimate, Low albedo effect of non-reflective building materials absorb heat and release them as infrared radiation. Low specific heat capacity of road surfaces and building materials make them to absorb large amount of heat and release them. Also, there is a lack of vegetation in urban microclimates, because they are replaced by artificial building materials such as tarmac or concrete. This creates a circumstance where evapotranspiration of vegetation is lacking, and this increases the surface temperature because, when water evaporates, it takes some of the heat as well. Shade created by vegetation are a contributor of reduced surface temperature, because the shade prevents the Sun to heat up the surface. Although urban buildings also create shade, their low specific capacity and low albedo effect cancels out the effect of shading the surface.

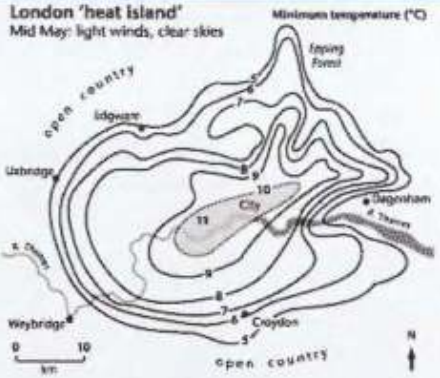


Figure 2.1 A heat map showing urban heat island effect of Greater London

5

Figure 2.2 Infrared radiation captured from Singapore

[1] Definition obtained from searching Google "microclimate definition"

Comments

5 Appropriate geographical terms are used to concisely explain relevant geographical theory. Good use of examples to develop key points.

IGCSE Geography Coursework - Microclimates

Wind speed and wind direction differ in urban microclimate compared to rural microclimates. Overall, wind speed is slower in urban microclimate than in rural microclimate due to friction from buildings. However, it is vastly different for different areas of cities. For example, straight streets with tall buildings can create an urban canyon, which produces high wind speed in an area due to Venturi effect[1]. This means that turbulence is created by high-rise buildings disrupting the flow of air. The wind tunnel effect is an effect which happens when the wind meets a tall building. When the wind hits the building, it changes the direction. Because buildings in an urban microclimate are close together, the airflow interferes with each other. In urban areas, buildings can also deflect the wind giving a variety of wind directions over a small area. Rural areas with low vegetation, such as crops and grass, will have high wind speeds and continuous wind direction due to little friction and turbulence. However, tall and dense vegetation, such as forestry, will cause low in speeds due to friction and turbulence.

Figure 2.3 An example of urban canyons in a city

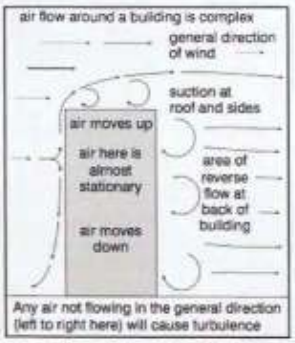


Figure 2.4 Wind tunneling effect

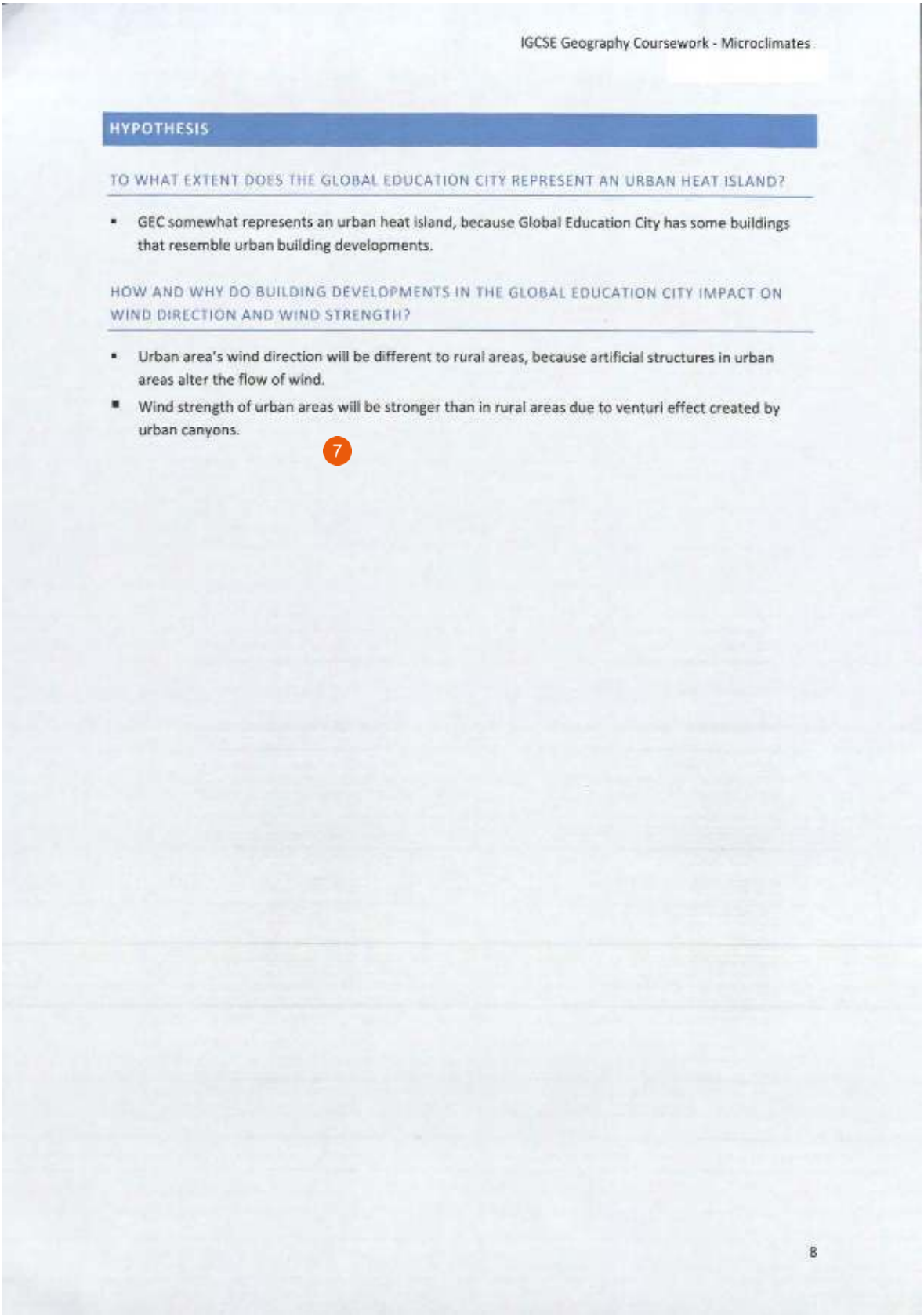
6

[1] A phenomenon which occurs when a fluid that is flowing through a pipe is forced through a narrow section, resulting in a pressure to decrease and a velocity to increase.

7

Comments

6 Further theory is provided which indicates a high level of understanding. A range of secondary sources are used to provide information on geographical concepts and details of the location.



IGCSE Geography Coursework - Microclimates

HYPOTHESIS

TO WHAT EXTENT DOES THE GLOBAL EDUCATION CITY REPRESENT AN URBAN HEAT ISLAND?

- GEC somewhat represents an urban heat island, because Global Education City has some buildings that resemble urban building developments.

HOW AND WHY DO BUILDING DEVELOPMENTS IN THE GLOBAL EDUCATION CITY IMPACT ON WIND DIRECTION AND WIND STRENGTH?

- Urban area's wind direction will be different to rural areas, because artificial structures in urban areas alter the flow of wind.
- Wind strength of urban areas will be stronger than in rural areas due to venturi effect created by urban canyons.

7

8

Comments

7 Clearly stated hypotheses which naturally follow from previously stated theory. Knowledge and understanding would be awarded low Level 3 at present. To improve this the learner could make more links to the actual study area.

METHODOLOGY

We went on the data collection on May 5th, 2016 from 9 a.m. to 3.p.m. We divided our year group into two large groups. One group went on the rural area(X) in the morning and other group went on the urban area(Y) in the morning. After lunch, we swapped over. There are 5 different locations for each area. We collected 10 readings of surface temperature, wind speed and wind direction for each location, each with 15 second interval.

We used infrared thermometer to measure the surface temperature(°C), electric anemometer for wind speed(m/s) and electric wind vane for wind direction(bearings). We used anemometer and wind vane effectively by holding it up above our body to eliminate as much possibility of obstructing the apparatus, therefore giving inaccurate measurements. Also, the North point of the wind vane and the Northern compass direction should match before measuring. We used infrared thermometer effectively by keeping an arm length distance from the ground and measuring from the same surface every interval.

We used photographs to keep the record of how the sites were for the duration of collecting data. We also used a data collecting sheet to record the measurements on and to keep the site description for later use Then the measurements were later collected into a spreadsheet, where all the data could be averaged.

8

Figure 3.11 Using the wind vane

Figure 3.12 Using the anemometer

Figure 3.13 Using the infrared thermometer

Figure 3.14 Anemometer and wind vane we used

Figure 3.15 Infrared thermometer we used

9

Comments

8 Although the methodology is concise the learner makes the points needed and this helps them to avoid exceeding the word limit. Photographic evidence contributes to the clarity.

The design of the data collection has been clearly planned. The sections which follow indicate how detailed the data collection was.

IGCSE Geography Coursework - Microclimates

Fig 3.1 Site 1 – Tea Plantation

Fig 3.2 Site 2 – Small Rural Woodland

Fig 3.3 Site 3 – Rural Grassland

Fig 3.4 Site 4 – Car Park

Fig 3.5 Site 5 – Large Woodland

Fig 3.16 Showing location and images of different rural sites(X)

10

IGCSE Geography Coursework - Microclimates

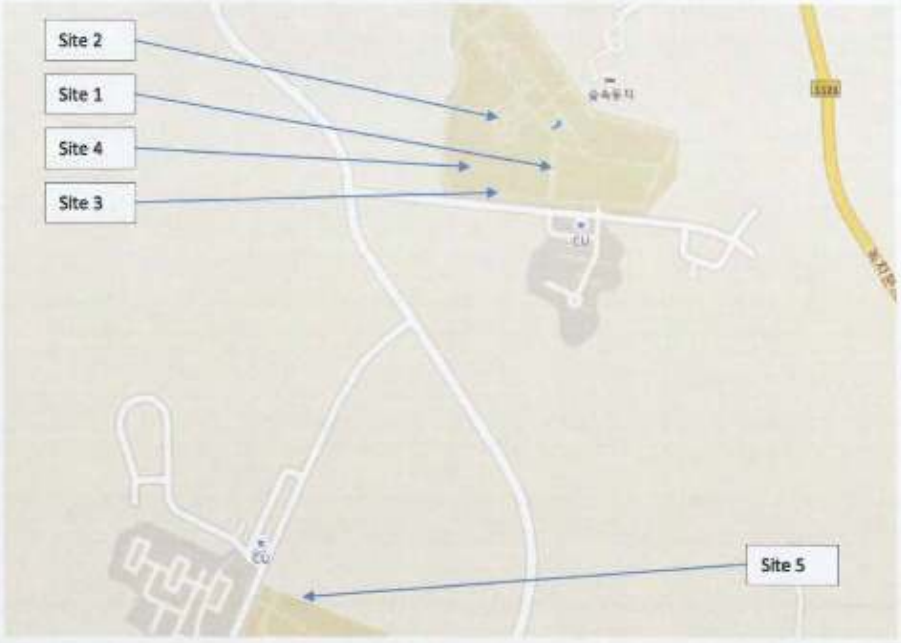


Fig 3.6 Site 1 – Between Canteen and Sports Hall

Fig 3.7 Site 2 – Tower

Fig 3.8 Site 3 – Tarmac road in front of the school

Fig 3.9 Site 4 – Roof of the School

Fig 3.10 Site 5 – Between KIS and BHA

Fig 3.17 Showing location and images of different urban sites(Y)

11

DATA PRESENTATION AND ANALYSIS

AIM 1: TO WHAT EXTENT DOES THE GLOBAL EDUCATION CITY REPRESENT AN URBAN HEAT ISLAND?

To understand whether the GEC represents an urban heat island, we have to compare the surface temperature of urban areas and rural areas.

Fig. 4.3 Heat map of rural areas

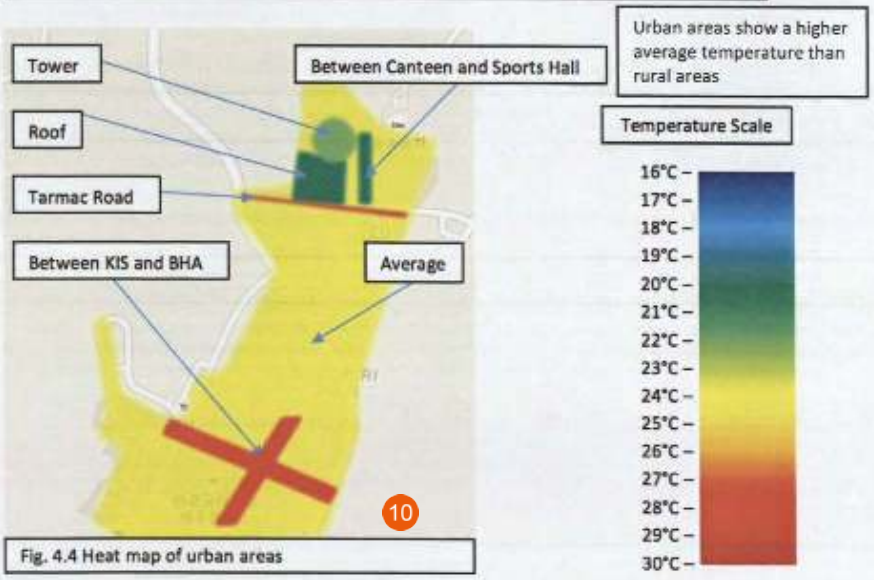


Fig. 4.4 Heat map of urban areas

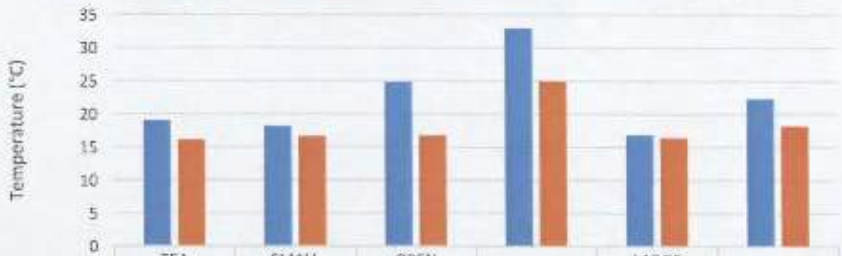
Comments

9 Sites are clearly located. Photographic evidence is very useful to show the nature of each site. This section is very well organised, but there could be some justification of why each site was selected.

10 This is a complex method of data presentation which allows immediate comparisons between sites to be made.

IGCSE Geography Coursework - Microclimates

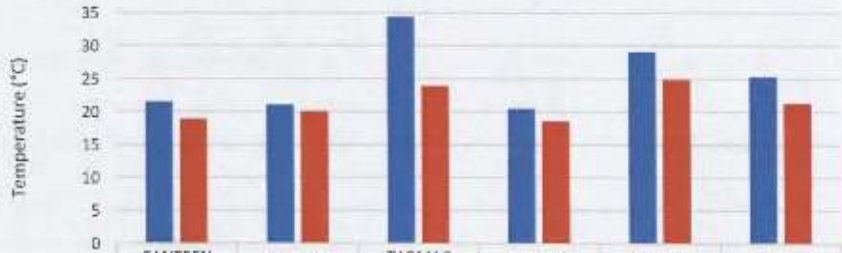
Fig 4.1. A graph showing the AM and PM temperature of Rural Areas



	TEA PLANTANTION	SMALL WOODLAND	OPEN GRASSLAND	CAR PARK	LARGE WOODLAND	Average
Temp AM	19.03	18.15	24.77	32.88	16.88	22.342
Temp PM	16.14	16.69	16.77	24.95	16.54	18.218

Fig 4.2. A graph showing the AM and PM temperature of Urban Areas

11



	CANTEEN SPORTS HALL	TOWER	TARMAC ROAD	ROOF	KIS/BHA	Average
Temp AM	21.5	21.06	34.37	20.47	29.12	25.304
Temp PM	18.89	19.99	23.91	18.52	24.88	21.238

Urban Site 1 – Between Canteen and Sports Hall – 20.41°C

This area is shaded by other buildings, which lowers the overall surface temperature because this area is not exposed to sunlight.

Radiators might influence the surface temperature because it constantly releases heat to the atmosphere, which might increase the surface temperature.

The surface type of the area is a gray pavement, which increases the surface temperature because it absorbs heat quicker that other surface types such as soils and grass.

13

Comments

11 Simple bar charts compliment the previous heat island maps. By having similar vertical scales the learner has aided comparison between sites. This counts as a second method of presentation and includes table of data.

Urban Site 2 – Tower – 20.59°C

There were some trees along the roads, which might affect the surface temperature because their evapotranspiration might lower the surrounding temperatures, and eventually the surface temperature.

Pale green vegetation surface type lowers the surface temperature because the specific heat capacity of grass is high.

Also, its higher albedo effect compared to other urban surfaces, such as tarmac, reduces the surface temperature

Urban Site 3 – Tarmac road in front of school – 30.01°C

There was some vegetation along the both sides of roads, which might affect the surface temperature because their evapotranspiration lowers the surface temperature.

No shades mean that the surface is exposed to high intensity of sunlight.

The surface type is a grey tarmac, which significantly increases the surface temperature because their low specific heat capacity makes them absorb heat much quicker.

Its low albedo effect means that the surface temperature increases because of high absorption of heat.

Urban Site 4 – Roof of the school – 19.65°C

This area is in a high altitude of above 3-story building. Because the area is exposed to higher wind speeds, it might also lower the surface temperature

The greenish vegetation lowered the surface temperature because of the higher specific heat capacity of grass

Dandelions

IGCSE Geography Coursework - Microclimates

Urban Site 5 – Between KIS and BHA – 27.36°C

Green sloped vegetation on two sides might lowered the surface temperature because its evapotranspiration lowered the heat level of surrounding area.

Red concrete pavement increased the surface temperature because its high specific heat capacity absorbs heat much quicker.

12

Rural Site 3 – Open Grassland – 20.77°C

There were some trees around the measuring area, which lowered the overall temperature because of its evapotranspiration effect.

Ground cover is a sparse green vegetation with some dead grass, which overall lowers the surface temperature because of their low density.

Rural Site 5 – Large Woodland – 16.70°C

This area is shaded by trees and roofed by leaves, which significantly lowers the surface temperature because roofed leaves and shades block sunlight from heating the surface.

The soil is covered with dead low-density leaves, which lowers the surface temperature. This is because low-density materials absorb less heat.

15

Comments

12 Well annotated photographs represent the third method of presentation of the data. This means the learner can be awarded Level 3 for presentation. The organisation is clearly logical.

Annotations identify both causes and effects of temperature changes. This demonstrates a high level of understanding.

Figure 4.3 and 4.4 shows us that in general, urban areas have a surface temperature approximately 3°C higher than the rural areas. Figure 4.1 and 4.2 also shows us that in the morning, urban areas have an average surface temperature of 25.3°C whereas in rural areas have an average surface temperature of 22.3°C. In the afternoon, urban areas have an average surface temperature of 21.2°C, whereas rural areas have an average surface temperature of 18.2°C. 13

This is because in general, surface types of urban areas had low specific heat capacity and high density, which meant that the materials absorbed and released heat more quickly. Also, there were buildings near the area, which are also made of materials that have high specific heat capacity, which meant that they also released more heat, therefore releasing its heat to the surface. 14

This is clearly evident in areas such as Tarmac Road and Between KIS and BHA. Tarmac Road had a surface temperature of 34.37°C in the morning and 23.97°C in the afternoon. Between KIS and BHA had a surface temperature of 29.12°C in the morning and 24.88°C in the afternoon. This contrasts with other regions such as Large Woodland in Rural areas, where it is 16.88°C in the morning and 16.54°C in the afternoon. As annotated above, the fact that the surface of Large Woodland is shaded by trees and covered with low-density leaves means that the surface temperature significantly decreases. 15

However, there are some anomalies to the data. The surface temperature in the morning is higher than the surface temperature in the afternoon because the cloud cover was more intense in the afternoon than in the morning. Also, the surface temperature of Between Canteen and Sports Hall was lower even though its surface type was grey pavement. This is because the area is shaded by the surrounding buildings. Also, the area near the Tower and Roof of the School also had lower surface temperature. This is because, as shown above, the surface type of the areas is a pale green vegetation, which means that it has a higher albedo effect and higher specific heat capacity, which lowers the surface temperature. Roof of the School is also in a high altitude, which means that the higher wind speed cools the surface of the area. Car park of Rural areas is also an anomaly because Car park is a human land use, which means that this area is not a natural environment. The fact that the surface type of Car park is tarmac, the surface temperature of Car park is significantly higher than other areas such as Large woodland. Also, heat generated by cars and buses is another factor of higher surface temperature. 16

Comments

13 Description of data.

14 Clear explanation of observed patterns.

15 Further reasoned explanation.

16 Identifies and explains anomalies. Good use of geographical terminology.

IGCSE Geography Coursework - Microclimates

AIM 2: HOW AND WHY DO BUILDING DEVELOPMENTS IN THE GLOBAL EDUCATION CITY IMPACT ON WIND DIRECTION AND WIND STRENGTH?

To show how the building developments in GEC impact on wind direction and wind strength, we have to compare urban areas with rural areas with virtually no building developments.

Fig. 5.1 A map showing the speed and direction of Urban areas

17

Comments

17 The flow lines are a fourth presentation technique. The learner has given a clear key.

IGCSE Geography Coursework - Microclimates

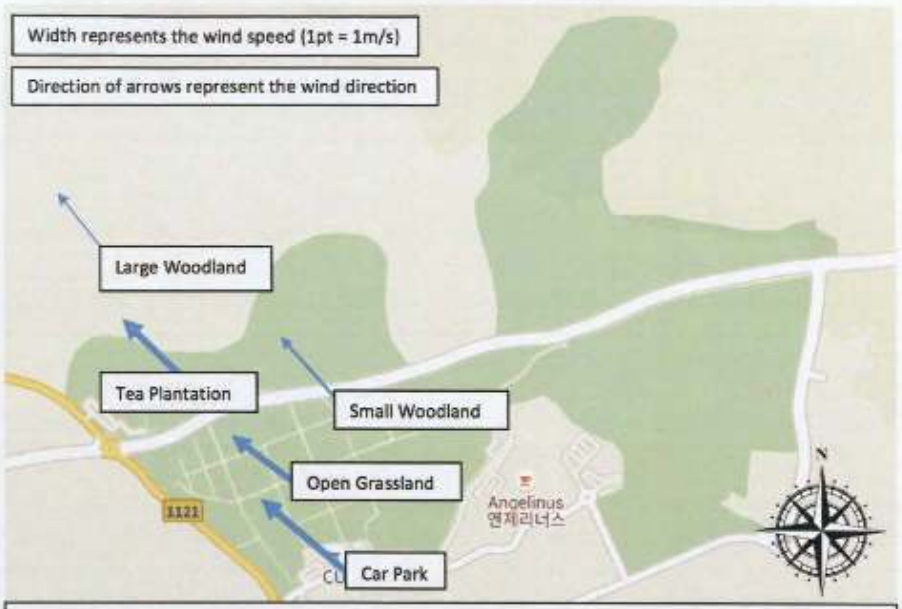
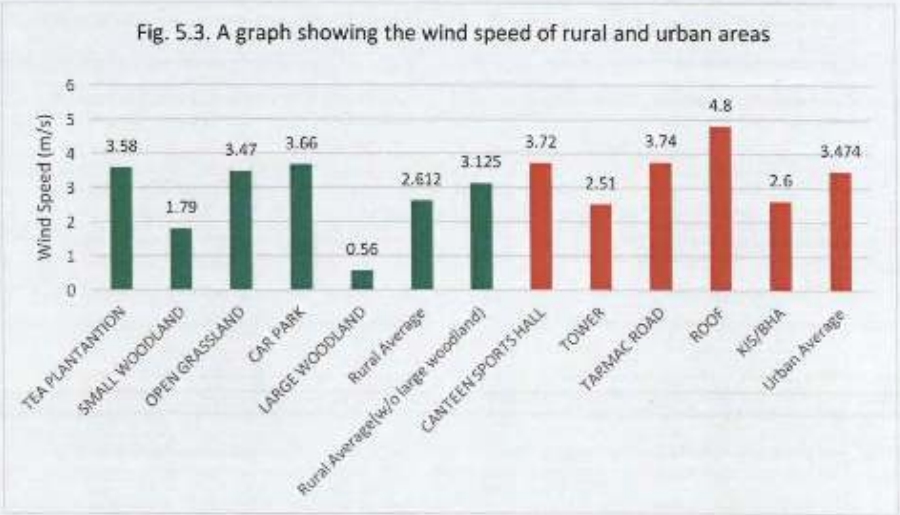


Fig. 5.2 A map showing the speed and direction of Rural areas

18



18

Comments

18 This is a useful bar chart which has been used to compare sites. This raises observation and collection of data well into Level 3 with regards to observations and collection of data.

IGCSE Geography Coursework - Microclimates

Fig 5.4. A wind rose showing the prevaling wind direction of Urban areas

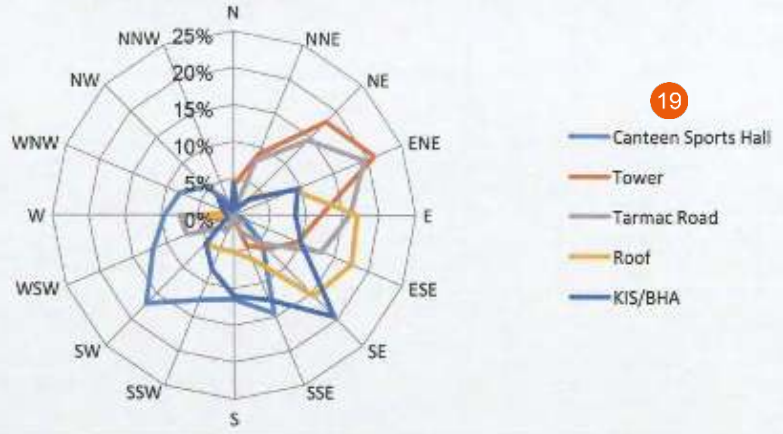
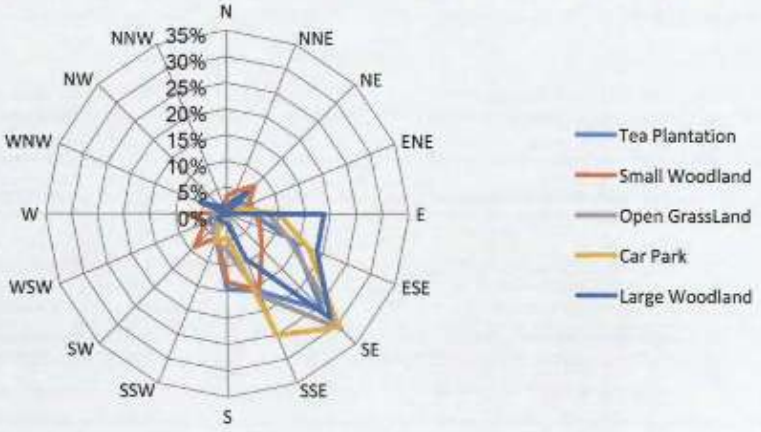


Fig. 5.5. A wind rose showing the prevaling wind direction of Rural areas



Urban Site 1 – Between Canteen and Sports Hall – SW prevailing – 3.72 m/s

This area is blocked by two buildings at two opposite sides, which disrupts the flow of wind, creating a wind tunnel.

Building orientated from N to S which channels the wind and therefore creating the venturi effect.

19

Comments

19 The rose diagrams demonstrate another complex technique. They are well executed, and help to make comparison between sites easy. This work is clearly high Level 3.

Urban Site 2 – Tower – ENE prevailing – 2.51 m/s

The tower, which is considerably taller than the surroundings, might contribute to the disturbance in the flow of wind.

Although not clearly visible, this area is surrounded with buildings of 3-story height with some narrow gaps between the buildings. This disruption slows down the wind and direction of wind, concentrating between buildings.

The gap between Geomun house (Building to the left of the tower) and Senior school (Building to the right of the tower) allows wind to enter the area from ENE.

Urban Site 3 – Tarmac road in front of school – ENE Prevailing – 3.74 m/s

There is a tall building on one side of the road, which forces the wind to go along the building or over the building, which makes the wind direction to be different than other areas with no obstructions such as buildings.

Urban Site 4 – Roof of the school – ESE Prevailing – 4.8 m/s

Because this area is high up in an altitude, this area will have higher wind speeds than other areas because of the lower atmospheric pressure in this area compared to sea level.

There are no tall obstacles, which means that there will be minimal disruptions of wind. This will result in increased wind speeds and having similar wind direction with other

Urban Site 5 – Between KIS and BHA – SE Prevailing – 2.6 m/s

The road with buildings sparsely located along it creates a minor disturbance in the flow of wind.

Rural Site 3 – Open Grassland – SE Prevailing – 3.47 m/s

20

There are no obstacles surrounding the area, which means that the flow of the wind is not disturbed. Therefore, the wind speed will be higher than other measurements and wind direction will be the same as other regions with no obstructions.

Rural Site 5 – Large Woodland – SE Prevailing – 0.56 m/s

This area is completely obstructed by trees. This will significantly lower the speed of wind because the trees block the wind from entering the area. This area can be considered as an anomaly because of the abnormal quantity of obstructions.

Comments

20 Annotated photographs support the learner's explanation of their data.

Figure 5.1 and 5.2 shows us that in general, rural areas have a regular wind direction from the Southeast, whereas urban areas have a varying wind direction. Also, Figure 5.3 shows us that in general, urban areas have higher wind speed than rural areas. This is evident because in Figure 5.3, average wind speed in rural areas is 2.61 m/s whereas average wind speed in urban areas is 3.47 m/s. Even if we exclude the data from large woodland, which can be classified as an anomaly, the average wind speed in rural areas is still lower at 3.13 m/s than in urban areas. 21

This is because in general, building developments in urban areas disrupted the flow of wind, which means that the direction will be altered by the formation of urban canyons. Also, the wind speed will increase because of the venturi effect created by the buildings.

This is clearly evident in areas such as Between Canteen and Sports Hall, which has SW prevailing wind and has a wind speed of 3.72 m/s. Because this area is blocked by two three-story buildings at two opposite sides, the airflow is disturbed, which means that urban canyon is created. Therefore, the wind speed is high and the wind direction differs to areas such as Open Grassland in rural areas, which has SE prevailing wind and has a wind speed of 3.47 m/s. The reason why this area contrasts to the other areas is because this rural area has no building obstructions, therefore no urban canyons or venturi effects created. Also the area near the tower is surrounded with buildings of 3-story height with some narrow gaps between the buildings. This disruption slows down the wind and alters the direction of wind, which is concentrated between the buildings.

However, there are some anomalies to the data. For example, Roof of the school has much higher wind speed, at 4.8 m/s, than other urban areas, and the wind direction is more similar to rural areas. This is because, unlike other urban areas, this area is higher up in the altitude and has no obstructions nearby, which means that this area will not have any urban canyons or venturi effects created. Also, Large woodland has much lower wind speed at 0.56 m/s. This is because this area is completely surrounded with trees in a close proximity and blocks most wind flowing into the forest causing friction. 22

Comments

21 Further reasoned explanation with reference to theory. This contributes to a thorough interpretation of the data and is awarded high Level 3.

22 This is an eloquent piece of written work despite some issues with grammar at times. As the grammatical issues do not detract from the reader's understanding they must not be penalised.

CONCLUSION

AIM 1: TO WHAT EXTENT DOES THE GLOBAL EDUCATION CITY REPRESENT AN URBAN HEAT ISLAND?

My hypothesis was that *"GEC somewhat represents an urban heat island, because Global Education City has some buildings that resemble urban building developments."* I think my hypothesis is correct because overall, the data suggests us that GEC represents an urban heat island. For example, surface temperature of urban areas is approximately 3°C higher than rural areas. This is because, unlike rural areas, the surface type of urban areas has a low specific heat capacity and high density, which means that the materials absorbed and released heat more quickly, leading to higher surface temperatures at night. The two sites that show the urban heat island the best are the tarmac road (30.01°C; low albedo; high absorption; low specific heat capacity; limited shade) in contrast to the large woodland area (16.7°C; dense shaded area; high specific heat capacity).

23

However, there were some anomalies in the data, such as data of Between Canteen and Sports Hall; the Tower; Roof of the School; Car park. Their data was not in a 'normal' range of the data expected from urban or rural areas. For example, the surface temperature of Between Canteen and Sports Hall was lower even though its surface type was grey pavement. This is because the area is shaded by the surrounding buildings. The tower (low urban surface temperature result), although an urban environment, had natural grass surfaces surrounding it, and the car park (high rural surface temperature result), although a rural environment, had manmade surfaces within a rural environment.

AIM 2: HOW AND WHY DO BUILDING DEVELOPMENTS IN THE GLOBAL EDUCATION CITY IMPACT ON WIND DIRECTION AND WIND STRENGTH?

My hypothesis was that *"Urban area's wind direction will be different to rural areas, because artificial structures in urban areas alter the flow of wind"* and *"Wind strength of urban areas will be stronger than in rural areas due to venturi effect created by urban canyons"*. I think my hypothesis is correct because overall, rural areas have regular wind directions, whereas urban areas have varied wind directions. For example, the rural wind direction was mainly from the SE as there were no large building deflecting the wind directions, whereas in the urban areas, wind direction varied from NE to WSW due to building layouts channeling the wind directions, such as the tower (ENE) and the canteen / sports hall (SW). Also, average wind speed in urban areas is 3.47 m/s, which is higher than 2.61 m/s, the average wind speed in rural areas. This is because the building development of urban areas create an urban canyon, which increases the wind speed in the area. In rural areas, the average wind speed was reduced due to the results of small and large woodland, causing friction, whereas the tea plantation and the open grassland areas had relatively high wind speeds due to little friction.

24

However, there were some anomalies to the data. For example, Roof of the school has much higher wind speed, at 4.8 m/s, than other urban areas, and the wind direction is more similar to rural areas. This is because, unlike other urban areas, this area is higher up in the altitude and has no obstructions nearby, which means that this area will not have any urban canyons or venturi effects created.

Comments

23 Clear conclusions are stated in light of the aims and key data is used to answer the hypotheses.

24 This is further evidence of data collection which reinforces the high Level 3 awarded for observation and collection of data.

EVALUATION

Our investigation had reliable results because of following reasons. Firstly, we used many data sets (200 per location) to increase the reliability of results by making anomalies of measurements have a minimal effect to our data. Secondly, we repeated our measurements over a period of time to get an average of our results, also increasing the reliability. Thirdly, we took photos and wrote site descriptions to remind us the features of the site. Finally, we divided our year group into two groups and swapped locations to record morning and afternoon readings, which enriched our data set.

However, we could have had more reliable results because of the mistakes we made as a group. Firstly, some of the students misused the equipment, creating inaccurate results. For example, some students did not align the wind vane to North, which caused inaccurate results of the wind direction. This problem can be solved by spending more time training students how to use the equipment accurately. In addition, some surfaces of the areas had 3 to 4 different surface types, which brought confusion to the students and created inaccurate results. This can be solved by measuring the proportion of different surface types in the areas and have readings proportional to different surface types. Also, we did not measure our data in 24-hour range. This can be solved by also measuring the data during night time, although it will not be realistic since the school closes before night time. So, we could use maximum-minimum thermometers left at different sites over 24 hours. Furthermore, the weather of the day we measured our data had an unusual temperature range between AM and PM. This problem can be solved by measuring the data across multiple days, possibly 5 days continuously to get reliable results. Finally, our equipments were not as accurate as we hoped it would be and some of them even were broken. This problem can be solved by buying new equipments which are more accurate.

Comments

25 The learner has written a sound evaluation referring to both strengths and weaknesses in their work. Improvements are suggested. This and the conclusion are clearly Level 3.

BIBLIOGRAPHY

- http://english.jeju.go.kr/files/image/imgsub02/no31_1.jpg - Title image

LOCATION

- http://www.ihtesh2015.org/images/sub/img_hotel01.jpg - Figure 1.1 (Modified)
- https://www.google.com/maps/@33.3842685,126.556441,11z - Figure 1.2
- https://www.google.com/maps/@33.2853164,126.2800486,4077m/data=!3m1!1e3 - Figure 1.3
- https://en.wikipedia.org/wiki/Jeju_Free_International_City_Development_Center

BACKGROUND INFORMATION

- http://www.gardening.cornell.edu/weather/microcli.html
- http://www.coolgeography.co.uk/A-level/AQA/Year%2013/Weather%20and%20climate/Microclimates/Urban_climates.htm
- http://www.metlink.org/secondary/key-stage-4/microclimates/
- https://www.openpermaculture.com/magazine/five-factors-affect-microclimates
- http://www.ecocem.ie/environmental,albedo.htm
- http://www.coolgeography.co.uk/A-level/AQA/Year%2013/Weather%20and%20climate/Microclimates/London_Heat_Island.JPG - Figure 2.1
- http://www.asiagreenbuildings.com/wp-content/uploads/2016/02/4027763485_9570dd5f07_b.jpg - Figure 2.2
- http://scied.ucar.edu/longcontent/urban-heat-islands
- http://www.actionbioscience.org/environment/voogt.html
- http://ibis.geog.ubc.ca/courses/geob370/students/class13/bho/
- http://www.newsworks.org/index.php/local/the-pulse/79275-the-science-of-wind-tunnels-where-and-why-those-harsh-winds-strike-
- Geofile Online (September 2003) 457
- http://s388.photobucket.com/user/jacobeclark/media/chicagocanyon2.jpg.html - Figure 2.3
- http://www.geocoops.com/uploads/2/4/5/3/24532387/659068.png?353 - Figure 2.4

METHODOLOGY

- Map images from Google Maps
- Figure 3.1 ~ 3.13 taken by ourselves
- http://g02.a.alicdn.com/kf/HTB1IDLvLFXXXXbrXXXXq6xXFXXXM.jpg - Figure 3.14
- http://buy4less.co.za/wp-content/uploads/2013/02/InfraRed-Thermometer.jpg - Figure 3.15

DATA PRESENTATION AND ANALYSIS

- Data from data excel sheet collected by students, which is organized by teachers
- Maps from Google Maps
- All other pictures taken by ourselves
- https://s-media-cache-ak0.pinimg.com/736x/65/a7/ca/65a7ca5dad5bcf8877e20fc936d80b75.jpg - Compass image

Comments

26 The comprehensive bibliography is further evidence of high levels of organisation.

Example Assignment 2

Name:

Candidate number:

Centre Number:

Word count: 970

Title: How does the Lyne Water channel change with distance downstream?

Introduction

Aim: How does the Lyne water channel change with distance downstream?

Hypothesis 1: average bedload size decreases with distance downstream

1 Hypothesis 2: bedload gets more rounded with distance downstream

Hypothesis 3: as cross-sectional area increases so does velocity downstream

Why did we choose the river Lyne?

We choose the Lyne Water because it is easily accessible and did not have terrain which was challenging and in most cases it follows Bradshaw's model

Location: River Lyne is found in the South East Scotland, it is a tributary for the River Tweed, it runs through west Linton and Romanbridge then goes through Flemmington and finally enter the River Tweed in West Peebles, Coordinates: 55,37N and 3,16 W 2

Figure 1: Bradshaw model

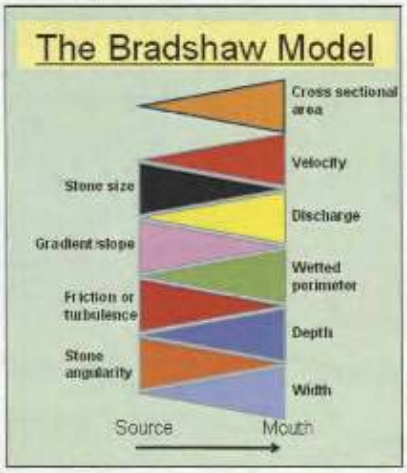


Figure one is Bradshaw model which shows how river characteristics typically change with distance downstream a river. This shows that I would expect channel depth to increase with distance downstream. Occupied channel width is also expected to increase with distance downstream. Load size is expected to get smaller. These relate to my three hypotheses

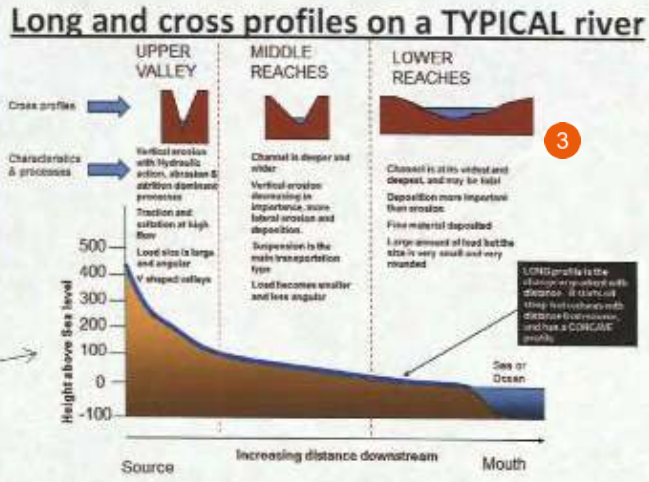


Figure 2: Diagram showing the typical changes of a river channel with distance downstream.

This shows us that the river channel becomes wider in width as it we go further downstream because you are getting more water in the channel as more tributaries are joining up and also middle course gets all the water from the upper and middle and lower course gets all the drainage from upper, middle and lower course as we can see in figure 1. The depth also increases further downstream because the size of the drainage area has increased with every bit further you go down as we can see in figure 1. The steepness of the valley side slope decreases further downstream you go because there aren't any mountains around the river because it's in the middle/lower course. The gradient of the river channel decreases further downstream as there is

Comments

1 Clear hypotheses are stated.

2 The learner describes the location of the River Lyne. They give some justification of why it was chosen.

3 There is reference to theory which links to at least two of the three hypotheses.

usually more soft rock in the lower course than in the upper course. You get more vertical erosion in the upper valley compared to lateral erosion which happens more in the lower course. Erosion happens in every part of the course but mostly in the lower course and also middle course and also the most deposition happens in the lower course because the velocity of the water has decreased and the weight of the rocks overpower the energy of the water. This helps explain my three hypotheses. 4

Sequence of investigation:

1. I researched what changes I expected in the river with distance downstream
2. I measured my river(the Lyne river)
3. I presented my field data in various of ways such as scatter charts
4. Then I interpreted what my data showed in terms of my three hypothesis 5
5. I concluded
6. I evaluated how well my research answered my three hypothesis

Definitions of key terms:

Bedload size: this is the size of the rocks which lay on the bottom of the river (river bed). Measured in cm

6 Bedload roundness: this is the roundness/how smooth of the rocks which lay on the bottom of the river (river bed). This is measured on the Powers index

Cross-sectional area: this is the average depth x the width of the river and can show how much water s in that area (cm^2)

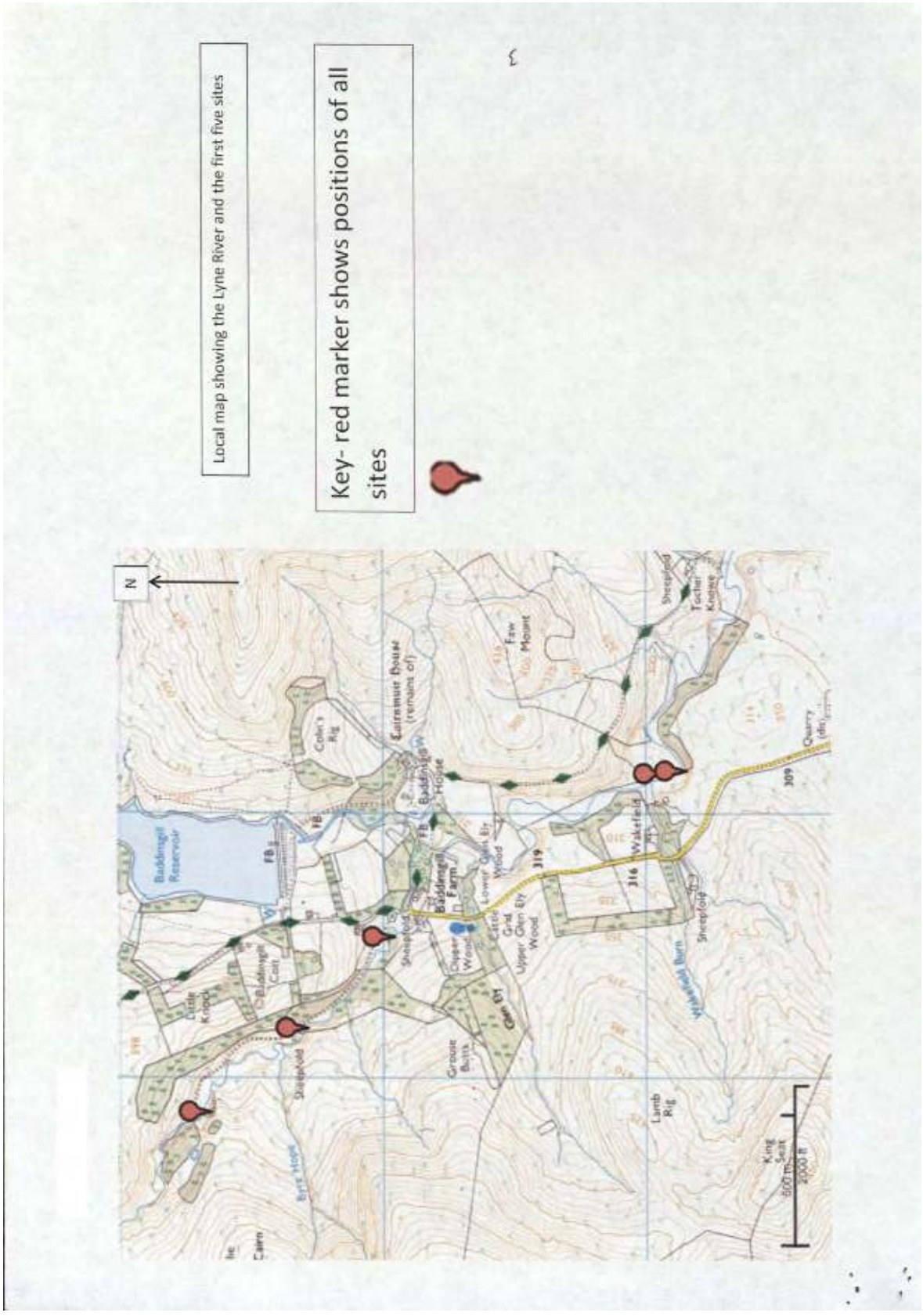
Velocity: speed of the water measured at the water surface measured in (m/s)

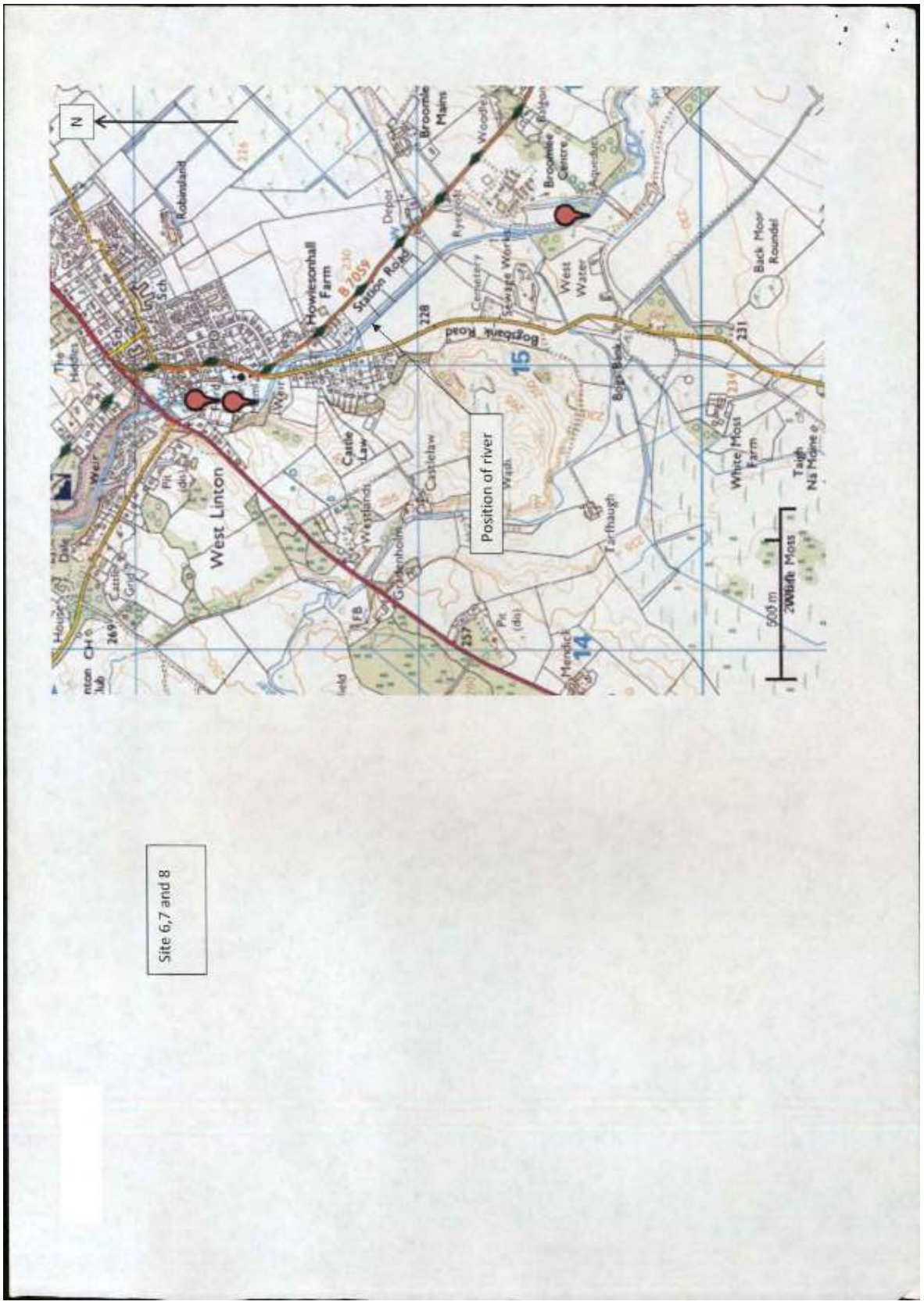
Comments

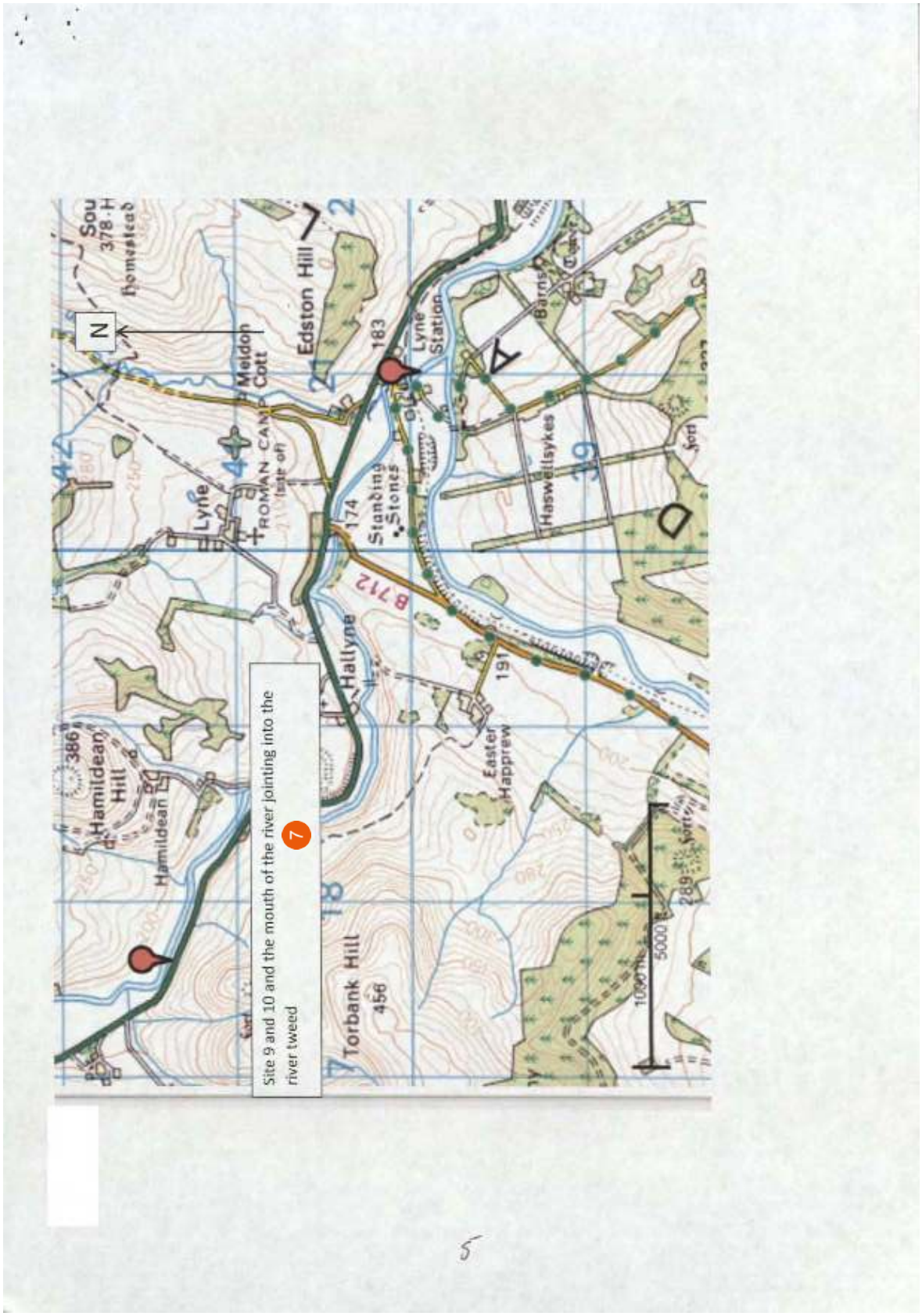
4 The learner has made some good use of geographical terms. However, this is not always well linked to the aims / hypotheses. They have not demonstrated any depth of understanding at this stage, so currently their knowledge and understanding would be awarded a low Level 2.

5 Gives a logical order of the sequence of events.

6 Definitions are helpful.

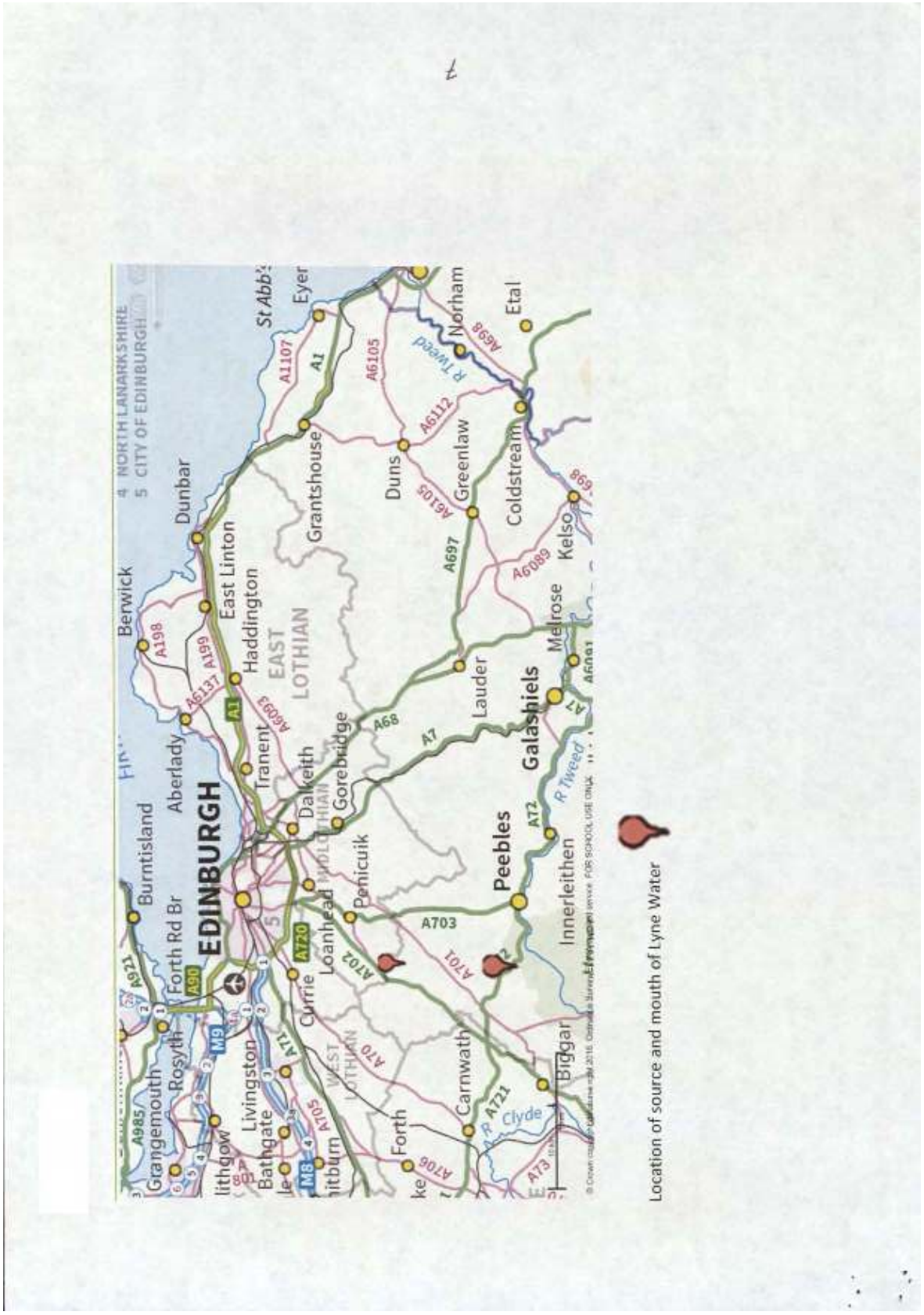

Local map showing the Lyne River and the first five sites
Key- red marker shows positions of all sites
N
Baddinagill Reservoir
Baddinagill Farm
Baddinagill House
Eastmuir House (remains of)
Colin's Rig
Few Mount
Sheepfold
Tocher Knowe
Quarry (dis)
Wakefield
Lower Glen Elr Wood
Upper Glen Elr Wood
Castle Knock
Grouse Butts
Lamb Rig
King Seat
309
316
319
FB

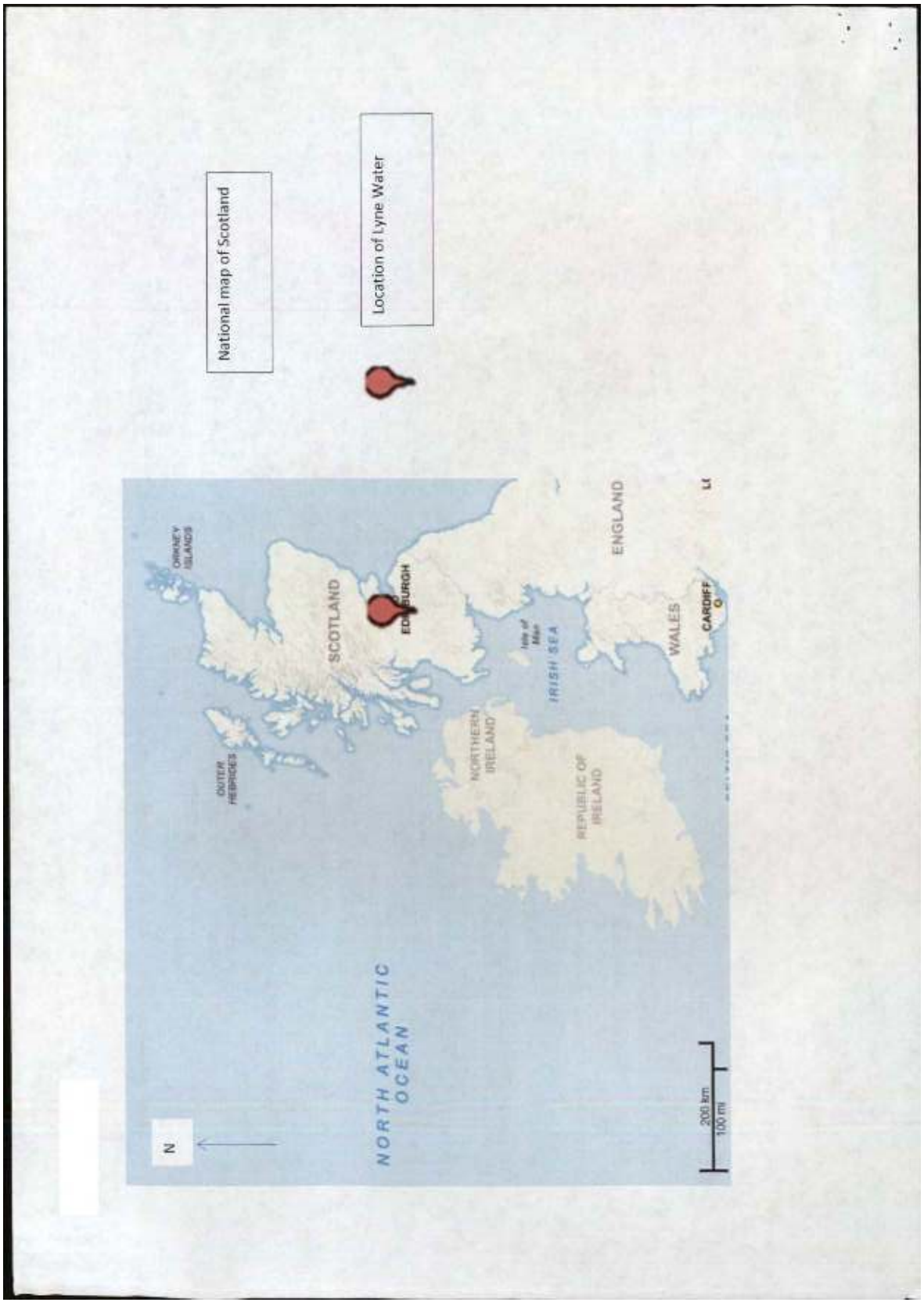

N
West Linton
Howieson hall Farm
B7059
Station Road
Broomie Mains
Broomie Centre
Robsland
Back Moor Roundel
West Water
Cemetery
Sewage Works
Dolphinton Road
Castle Law
Castielaw
Westlands
Tarfhaugh
White Moss Farm
Taigh Na Maine
Position of river
Site 6,7 and 8
500 m
2 Wide Moss
15
14



Comments

7 The sites used in the investigation are well located, although these might have been more effectively shown on one map. All maps used have a scale.


4 NORTH LANARKSHIRE
5 CITY OF EDINBURGH
EDINBURGH
EAST LOTHIAN
WEST LOTHIAN
MIDLOTHIAN
Berwick
Dunbar
East Linton
Haddington
Grantshouse
Duns
Greenlaw
Coldstream
Kelso
Norham
Etal
Melrose
Galashiels
Lauder
Peebles
Innerleithen
Biggar
Carnwath
Penicuik
Gorebridge
Dalkeith
Tranent
Aberlady
Burntisland
Forth Rd Br
Rosyth
Grangemouth
Livingston
Bathgate
Currie
Loanhead
Forth
Clyde
R Tweed
A1
A68
A7
A697
A72
A703
A701
A702
A720
A90
M9
M8
A921
A985
A705
A199
A198
A6137
A6093
A1107
A6105
A6112
A6089
A698
Location of source and mouth of Lyne Water


National map of Scotland
Location of Lyne Water
N
NORTH ATLANTIC OCEAN
SCOTLAND
ENGLAND
WALES
IRISH SEA
NORTHERN IRELAND
REPUBLIC OF IRELAND
ORKNEY ISLANDS
OUTER HEBRIDES
EDINBURGH
CARDIFF
200 km
100 mi

Methods

Data measured	detailed description of how its measured	Sample size/data type sampling method	Why measured e.g: in order to be able to investigate whether i.e relate to one of you hypothesis
Depth(cm)	Ten lengths were measured with a metre rule evenly distributed across the rivers width. The metre rule is placed vertically into the water, we read the measurement from where the water ended	Ten and took average	To be able to find the cross sectional area Hypothesis 3
Width(cm)	Two pupils held a Measuring tape from one side to the other perfectly perpendicular across the water. The distance from river bank to river bank.	One	To be able to find the cross sectional area Hypothesis 3
Velocity(m/s)	The tape measurer was stretched 5m along the middle of the flow and a dog biscuit flowed down the river with us timing how long it took to get from one side to the other, we measured this with a timer (stopwatch). Done three times and calculated an average	Three and took average	This was measured for hypothesis 3,
Bedload roundness(cm)	Was decided when two pupils chose which category the rock went into. Three rocks were chosen randomly and measured with the powers index ✓	Three and took average	For the hypothesis 2
Bedload size (cm)	Three rocks are taken and length and width are measured. Bedload size is length x width	Three and took average	For hypothesis 1
Cross sectional area(cm^2)	By calculating average depth x width		For hypothesis 3

9

Comments

8 A range of primary data has been collected which is all linked to the hypotheses. This shows that the learner has undertaking sound planning.

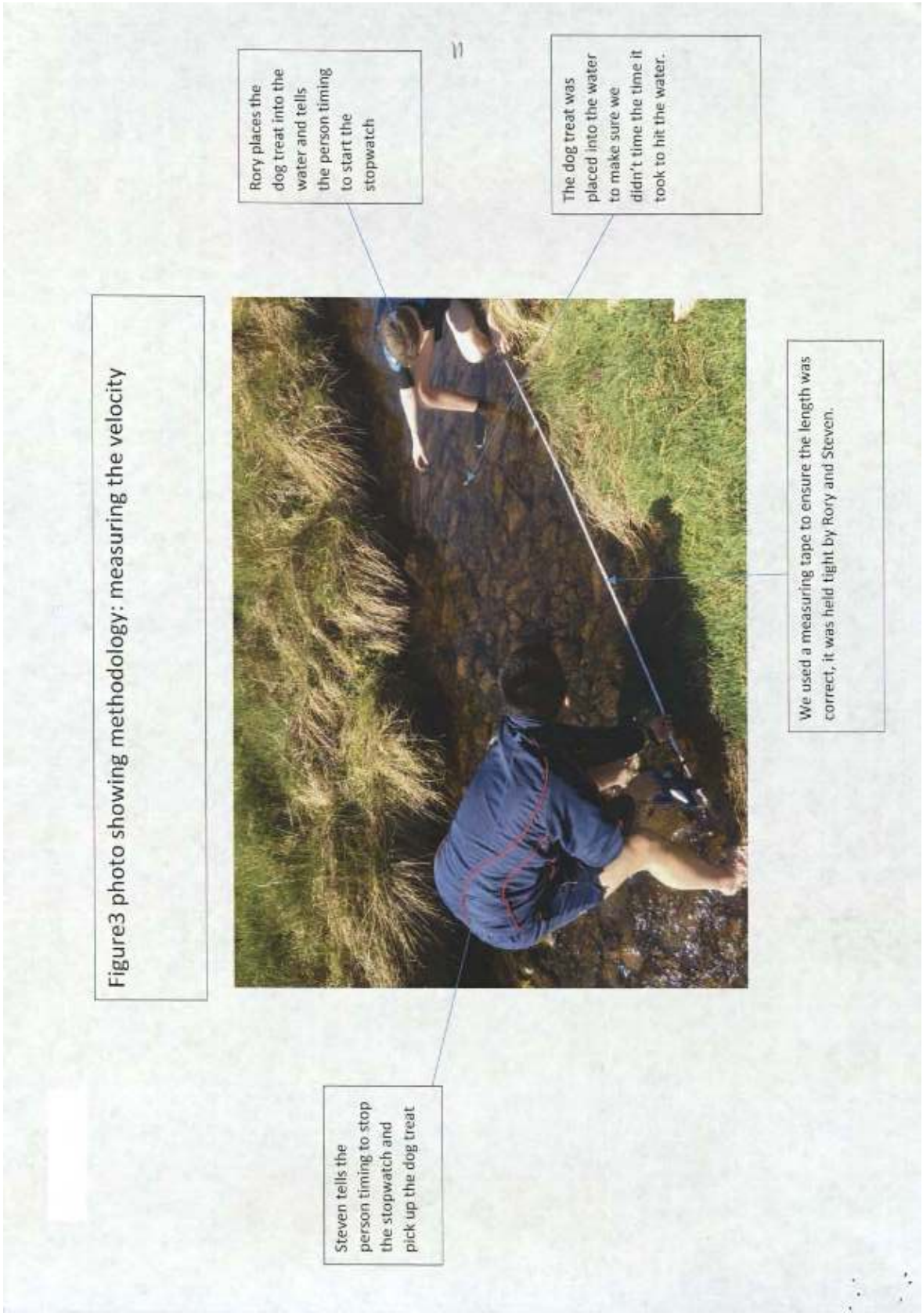


Figure3 photo showing methodology: measuring the velocity

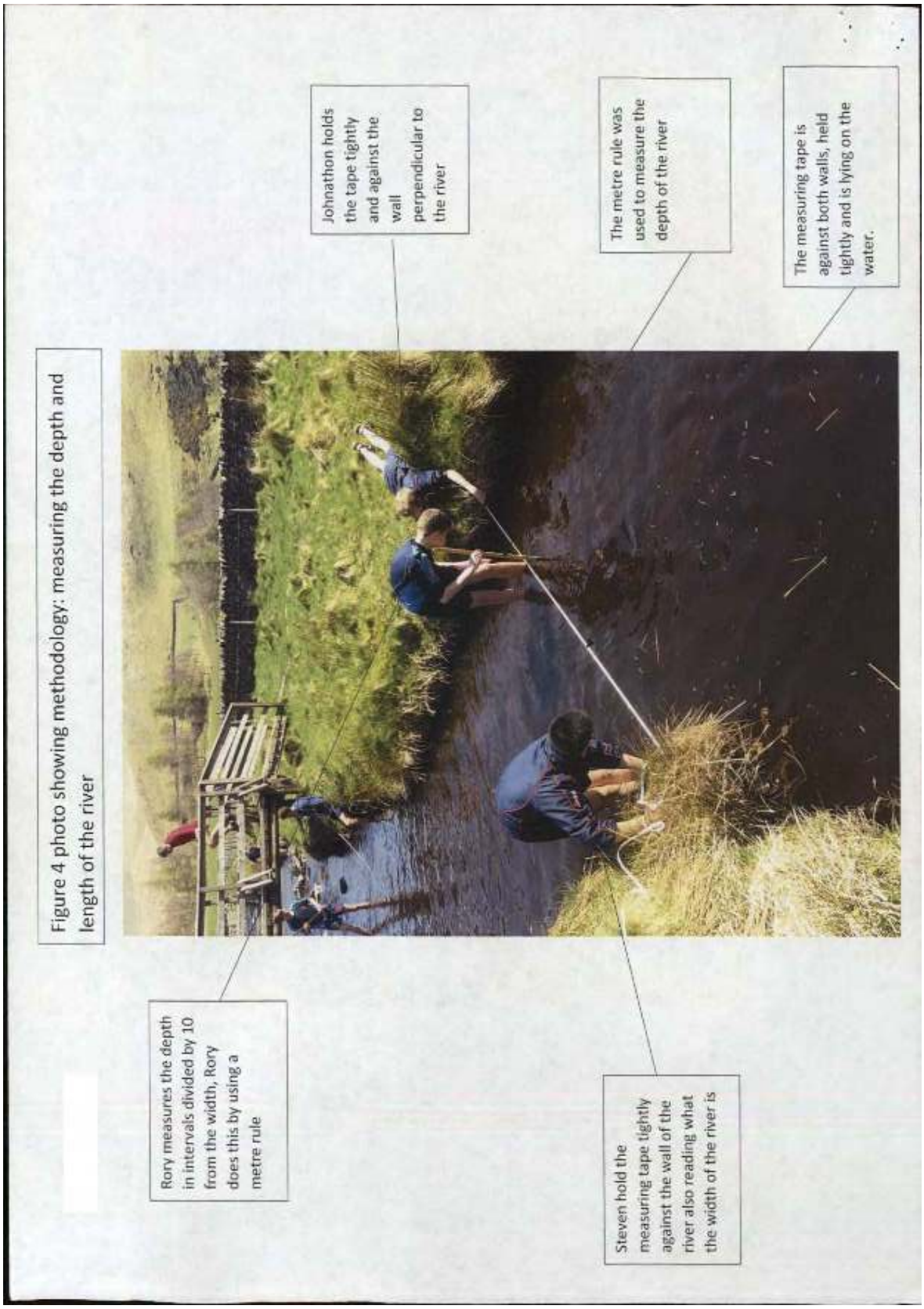
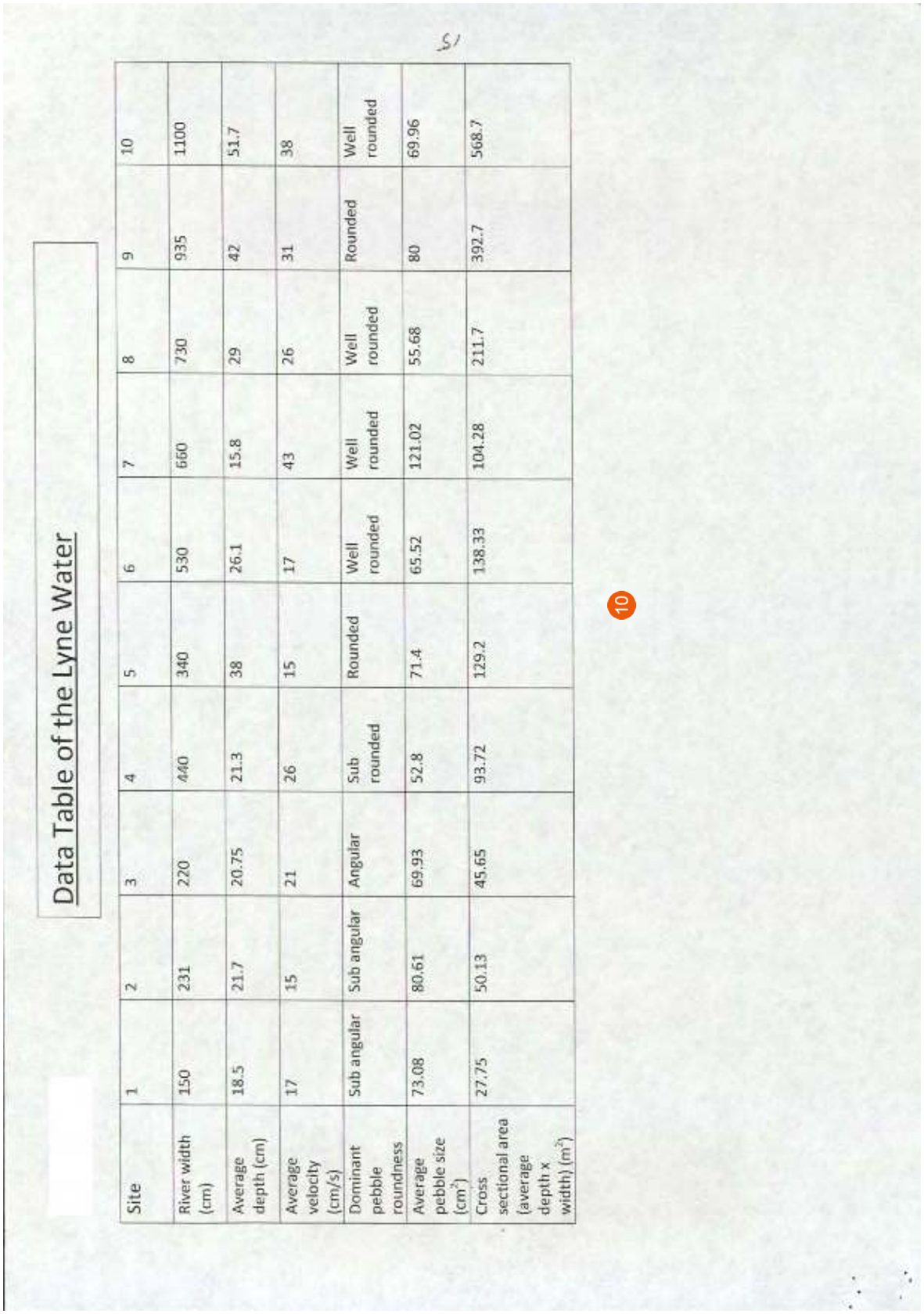


Figure 4 photo showing methodology: measuring the depth and length of the river
Rory measures the depth in intervals divided by 10 from the width, Rory does this by using a metre rule
Johnathon holds the tape tightly and against the wall perpendicular to the river
The metre rule was used to measure the depth of the river
The measuring tape is against both walls, held tightly and is lying on the water.
Steven hold the measuring tape tightly against the wall of the river also reading what the width of the river is

Figure 5 photo showing methodology: measuring width, length and Powers index

Comments

9 Annotated photos help give further detail on data collection methods.



Data Table of the Lyne Water

Site	1	2	3	4	5	6	7	8	9	10
River width (cm)	150	231	220	440	340	530	660	730	935	1100
Average depth (cm)	18.5	21.7	20.75	21.3	38	26.1	15.8	29	42	51.7
Average velocity (cm/s)	17	15	21	26	15	17	43	26	31	38
Dominant pebble roundness	Sub angular	Sub angular	Angular	Sub rounded	Rounded	Well rounded	Well rounded	Well rounded	Rounded	Well rounded
Average pebble size (cm^2)	73.08	80.61	69.93	52.8	71.4	65.52	121.02	55.68	80	69.96
Cross sectional area (average depth x width) (m^2)	27.75	50.13	45.65	93.72	129.2	138.33	104.28	211.7	392.7	568.7

5/

10

Comments

10 Data table indicates of clear organisation and detailed data collection. The fact that samples have been taken at 10 sites gives the data greater validity. This element of the assignment can be awarded Level 3. They could have improved this further by justifying the selection of each site.

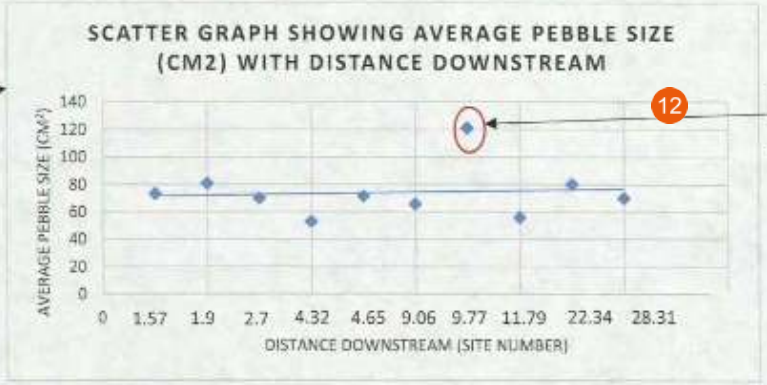
Hypothesis 1:

Average bedload size decreases with distance downstream

What does Bradshaw's model expect and why?

11 Bradshaw's model expects that the bedload size will decrease with distance downstream, this is because the rocks have been eroded more by attrition as there are more rocks, and because the velocity is faster downstream than it is upstream the force is stronger and therefore erodes more.

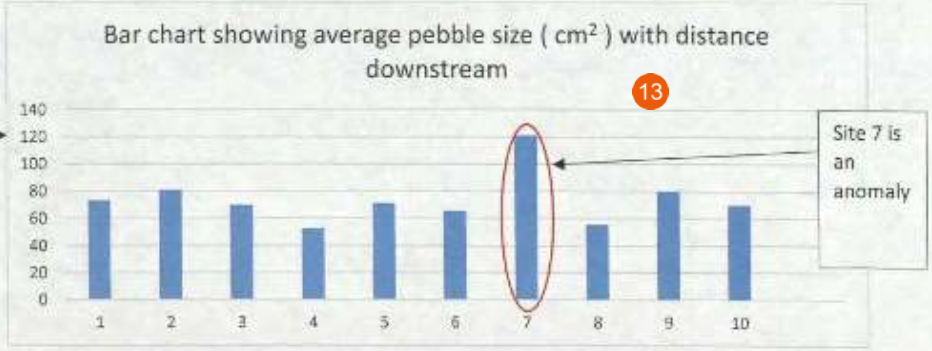
Figure 6:



12 Site 7 is an anomaly

14 The Scatter graph and proportional symbol map shows that the pebble size increases with distance downstream but mostly stays level with a few marks further down and one anomaly, this is wrong because of the anomaly in site 7 which changes the line of best fit because the error is very large. The anomaly could have been created by us not choosing the rocks randomly (human error) or that it was in a farmers area and he had dropped rocks into that area.

Figure 7:



13 Site 7 is an anomaly

This Bar graph shows how pebble size changes with distance downstream. This also goes against my hypothesis because it shows pebble size staying almost level but doesn't decrease, in the 2nd to 4th site my results agree with the hypothesis but other than that it changes irrationally. Site 7 is an anomaly because it is much larger than all of the other sites, the anomaly could have been caused by human error or even by the fact that some farmers

17

Comments

11 The learner has made appropriate reference to theory.

12 Highlighting the anomaly adds some complexity to a basic technique.

13 Another anomaly is identified but the explanation is weak.

14 The bar chart shows the same data as the scatter graph so does not add to the explanation underneath.

dropped rocks which are larger than the other rocks in the river and we were unlucky to choose those rocks.

Hypothesis 2:

Bedload gets more rounded with distance downstream

What does Bradshaw's model expect and why?

Bradshaw's model expects that the bedload gets more rounded the further downstream you go, this is because of attrition and abrasion eroding the rocks making them more rounded further downstream while the rocks are much more jagged and irregular upstream.

These presentation of change in pebble roundness with distance downstream shows that the stone angularity changes with distance downstream becoming more and more rounded that further downstream. At site 1 the powers index showed us that the rocks were Sub-angular while at site 10 the rocks were much more rounded with the powers index showing us they were well rounded. Site 3 is an anomaly as it goes against my hypothesis as it is jagged and less rounded than the two sites before it, this could be because new rocks have been thrown in by farmers or that we misread the powers index and measured it as less rounded than it actually was.

Hypothesis 3:

As cross-sectional area increases so does velocity downstream

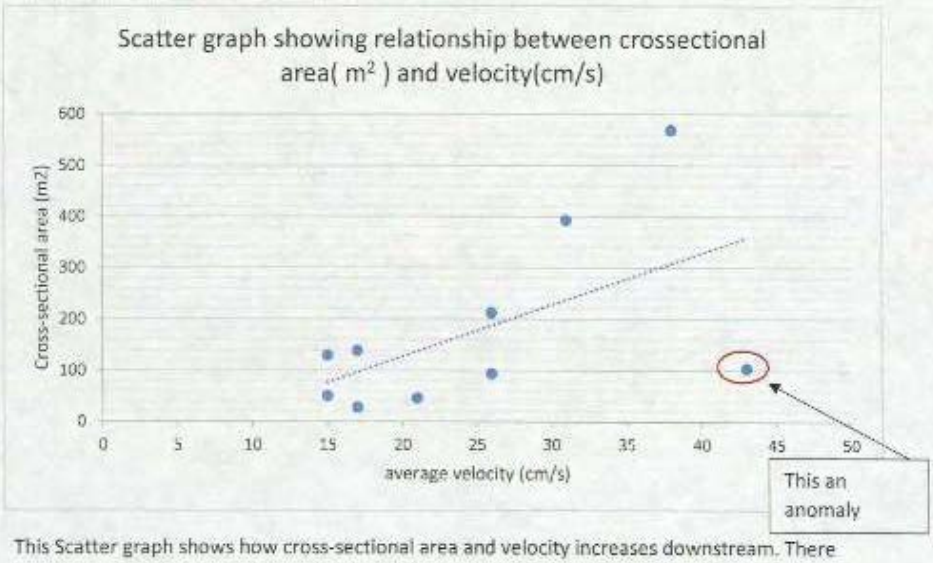
Comments

15 The located data is a more complex way of displaying the information. Once again though the explanation for the observations is poor. However, they are able to describe what they would expect to observe according to theory.

What does Bradshaw's model expect and why?

Bradshaw's model shows us that cross sectional area increases with distance downstream, this is because the area where the river flows is less V-shape valley and more flat floodplains where the rock is much softer and erodes more easily creating a larger cross sectional area. It also shows us that velocity increases with distance downstream because the depth is deeper and the width is wider meaning that less water percentage is touching the river bed and therefore the water moves faster.

16



This Scatter graph shows how cross-sectional area and velocity increases downstream. There is an anomaly circled in red, this could have been caused because of human error or the river passing through a harder area of rock meaning the width would be much less as much less of the river would have been eroded. This correlates with my hypothesis as the line of best fit going upwards and not downwards.

17

19

Comments

16 This is a similar technique to the one used for the presentation of the data linked to hypothesis 1. This scatter graph can be counted as an additional data presentation technique as the same data for hypothesis 1 was shown as a bar chart. Therefore this learner has used three types of graph. Two of these show added complexity which means Level 3 can be awarded for organisation and presentation.

17 Once again the learner demonstrates clear knowledge of theory, although the scatter graph does not show distance downstream. They have given some valid explanation. The analysis is Level 2 since it lacks the detail to be termed thorough.

The lack of understanding shown also means Level 2 is awarded for knowledge and understanding.

Overall conclusion:

Hypothesis 1:

Average bedload size decreases with distance downstream

As we go further downstream the bedload size stays mostly the same size getting bigger towards the end because of the anomaly, this can be seen in data table. It shows that at site one bedload size was 73.08 cm^2 while at site 10 it had decreased to 69.96 cm^2

Hypothesis 2:

Bedload gets more rounded with distance downstream

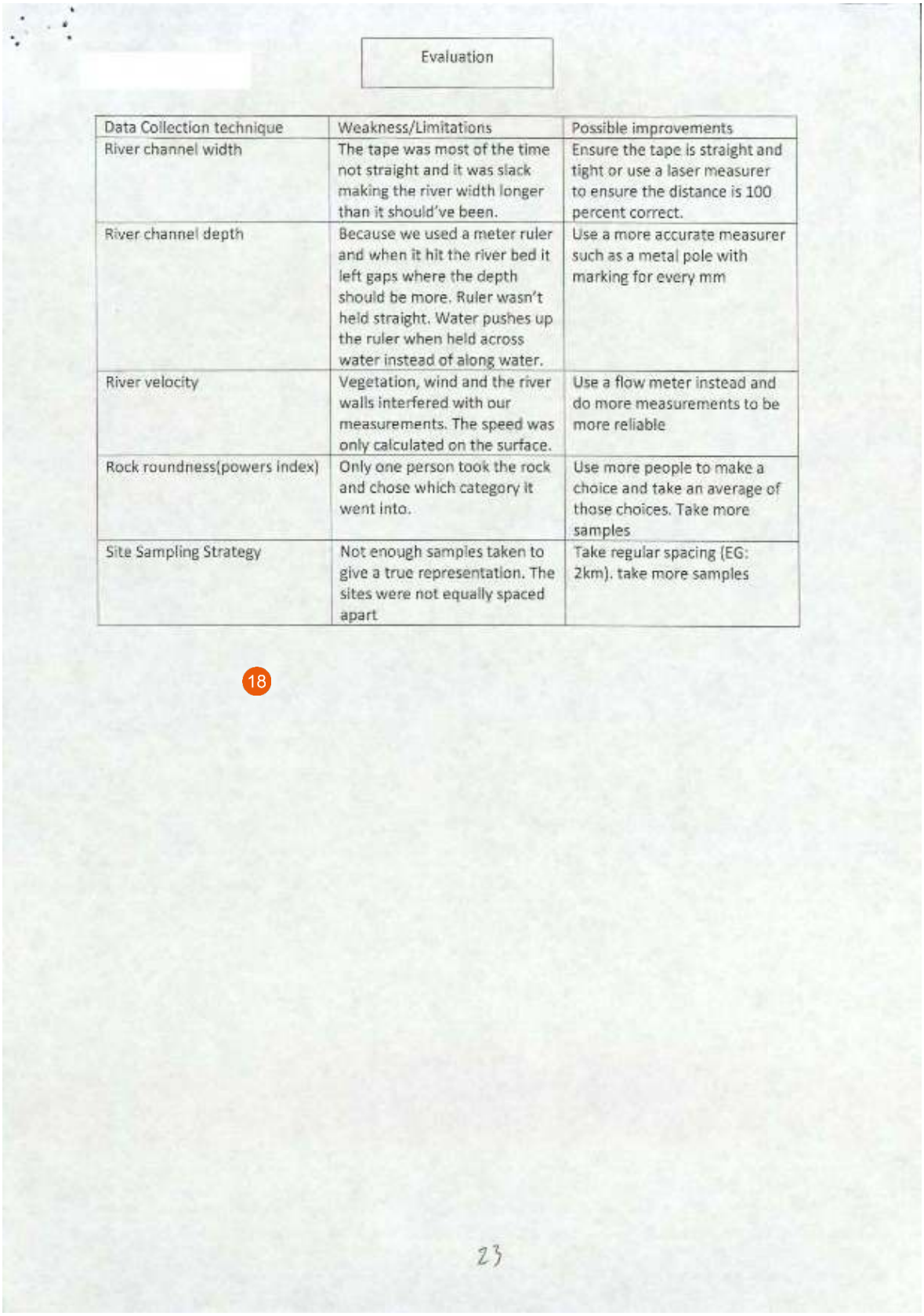
Bedload gets more rounded with distance downstream which follows more hypothesis and can also be seen on data table. It shows that at site one the rocks are sub-angular while at site 10 the rocks are well rounded.

Hypothesis 3:

As cross-sectional area increases so does velocity downstream, this follows my hypothesis and can be seen on the data table. It shows that at site one cross-sectional area was only 27.75 m^2 with a velocity of 17 cm/s. this changed to 568.7m^2 and 38 cm/s at site 10.

21

Comments



Evaluation

Data Collection technique	Weakness/Limitations	Possible improvements
River channel width	The tape was most of the time not straight and it was slack making the river width longer than it should've been.	Ensure the tape is straight and tight or use a laser measurer to ensure the distance is 100 percent correct.
River channel depth	Because we used a meter ruler and when it hit the river bed it left gaps where the depth should be more. Ruler wasn't held straight. Water pushes up the ruler when held across water instead of along water.	Use a more accurate measurer such as a metal pole with marking for every mm
River velocity	Vegetation, wind and the river walls interfered with our measurements. The speed was only calculated on the surface.	Use a flow meter instead and do more measurements to be more reliable
Rock roundness(powers index)	Only one person took the rock and chose which category it went into.	Use more people to make a choice and take an average of those choices. Take more samples
Site Sampling Strategy	Not enough samples taken to give a true representation. The sites were not equally spaced apart	Take regular spacing (EG: 2km). take more samples

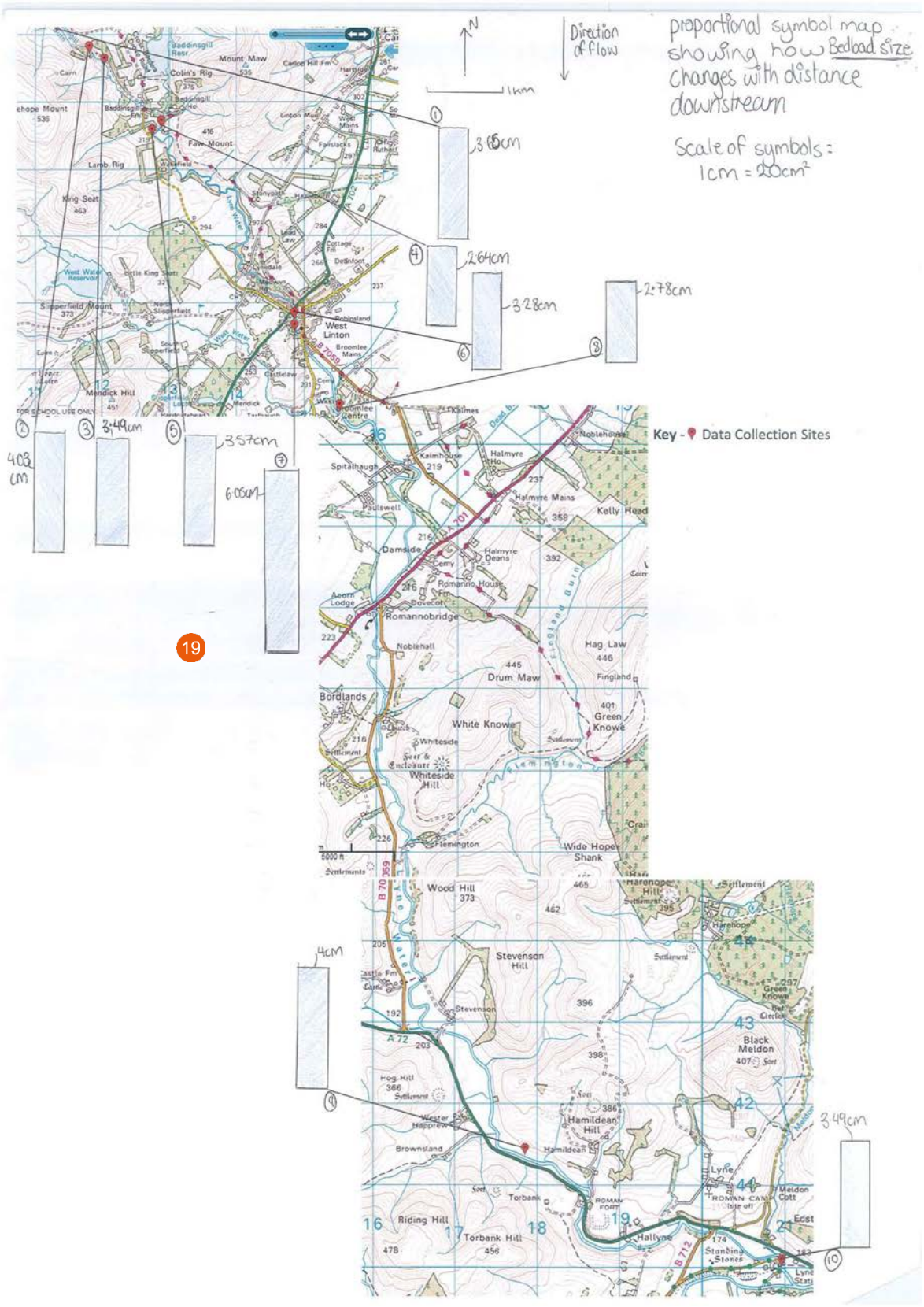
18

23

Comments

18 The evaluation identifies weaknesses and suggests some valid solutions. Together with the conclusion section, this allows low Level 3 to be awarded.

Comments



Comments

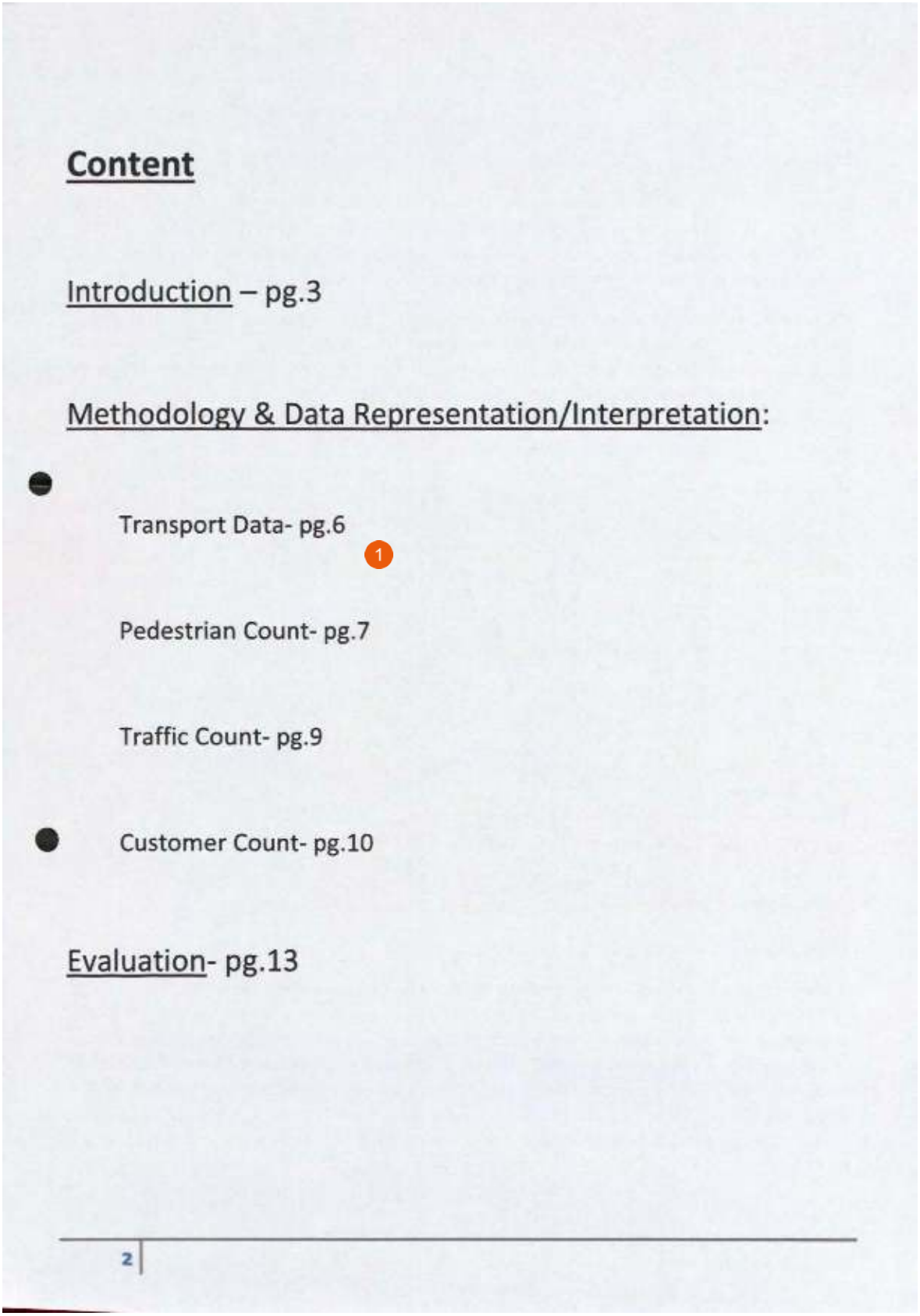
19 This is a successful method of presentation using located bars. However, it is not referred to at all in the coursework.

Example Assignment 3

IGCSE Coursework:

A Study of Luxembourg City

1



Content

2

Comments

1 An accurate index of contents contributes to the organisation of the study.

Introduction

Luxembourg is in Western Europe situated in-between 3 significantly larger countries, Germany, Belgium and France. Luxembourg City is located in the south as seen on the map and it is in proximity to the borders of its neighbouring countries as it is quite a small country; it is known as one of the smallest sovereign states in Europe. Luxembourg City is approximately 10 miles from each of its nearest borders.

2 The purpose of this investigation is to determine Luxembourg City's daily human activity in terms of their periods during the day of most frequency, their preference of restaurants during the times of 12:55-13:05 in a designated location and how land along the Grand Rue is being occupied. The methods used to gather all this data were pedestrian/traffic counts in several locations, surveys on determining transport preferences and counts for restaurant popularity in the Place d'Armes.

Figure 1 – map of Luxembourg and its neighbouring countries

A pedestrian count is the amount of people that travel along a path, road or an intersection. This is usually split into different time periods and usually takes place in several locations within the CBD. The CBD, otherwise known as the central business district is the hotspot for business/retail being it mainly tertiary sector in majority of cities across the world. Whereas a traffic count concentrates on the minor and major roads within the CBD and each road that is investigated, just like the pedestrian count, is dealt with at different periods of the day. A questionnaire is a type of data collection where you question people on a particular topic and record their opinion and view in order to prove or disprove any speculation you might have.

3

3

Comments

2 Some useful background information has been provided. The map used has a scale.

3 The learner has defined some key terms. They have demonstrated some knowledge, but limited understanding at this point.

There are several outcomes I expect to achieve from each of my investigations:

- I predict there to be more pedestrians during the hours of 12:55-13:05 in comparison to the hours prior to that as there tend to be more pedestrians during lunchtime period.
- During the period of 12:55-13:05, otherwise known as lunchtime there will be more consumers choosing low order fast food outlets compared to high order restaurants in comparison to any other restaurant within Place d'Armes.
- I predict there to be more traffic on the peripheral ring roads compared to the roads within the core of the CBD.
- I predict that majority of employees that commute into the city use public transport, either buses or trains.

The reason behind this investigation is the fact that we are eager students who wish to stress and unfold theories that we had conceived in class. My investigation will either prove or disprove my hypothesis which I had stated prior to my excursion.

Figure 2 – Place d'Armes which is a key location through my investigation

4

Comments

4 These are clear hypotheses, but there is little in the way of justification. Limited understanding demonstrated to this point, so currently the top of Level 1 for knowledge and understanding would be awarded.

5

Figure 3 – represents the traffic count locations

Figure 4 – representing the pedestrian count locations

5

Comments

5 The learner has located the sites at which traffic and pedestrian counts will be carried out. The maps used have no scale.

Methodology & Data Representation & Interpretation: Transport Data

One of my data collections derived from a survey I made where I asked employees at random retail outlets along the Grand Rue, by what means of transport they use to get to work on a daily basis. There were five possible categories which were train, bus, car, bike and the only slight exception foot. I asked a total of 50 people. The survey was the most efficient method in which I was able to acquire the information from each employee and it also forms part of random sampling. It is giving each individual an equal chance of being selected as I had not planned who or at which business to question before hand.

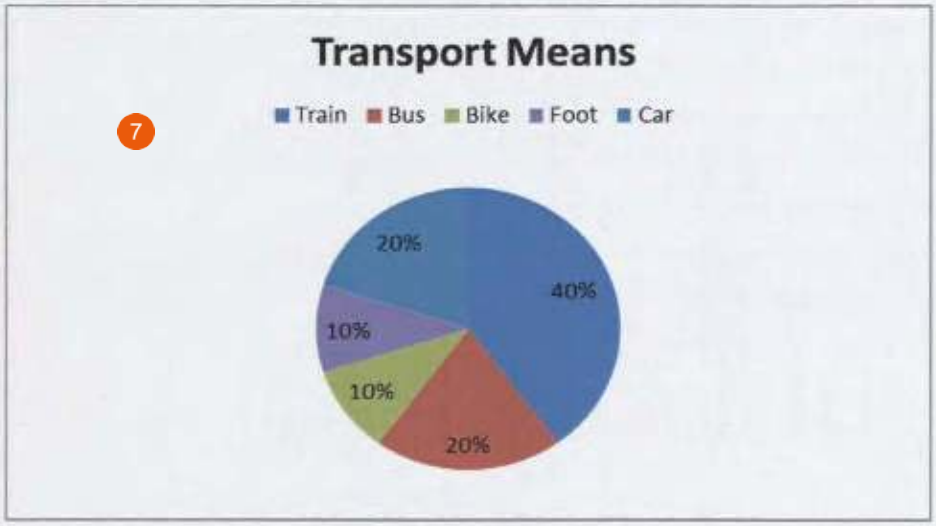


Figure 5 – represents the transport means after questioning 50 employees along Grand Rue

The pie chart above expressing means of transport people result to when commuting. Individuals were selected at random from several retailers and were all posed the same question 'how do you get to work'; the graph shows. 40% take the train, 20% take the car, 20% take the bus, 10% take their bike and 10% go by foot. This information concludes that the most popular means of transport is train and the least popular are foot and bike; this data supports my hypothesis as public transport, specifically the train has come out higher in comparison to all the other results. If bus is included, then public transport makes up for 60%.

The reason for this is that Luxembourg hosts a large percentage of cross boarder worker, in particular the French. Approximately 80,000 French citizens commute into Luxembourg on a daily basis and the reason for the train popularity is that there is a direct high speed TGV route from France to Luxembourg. This method is more convenient as money is saved on fuel for vehicles and motorway traffic is avoided. The main railway station is linked to the CBD by numerous bus routes, for added convenience. Public transport in Luxembourg is subsidised by the government therefore the price is quite low, ultimately making it affordable for majority of the population. Using public transport is also encouraged by the government as within the city there are limited parking spaces and the ones available, are quite expensive; so in theory public transport is a cheaper option. There are also bus lanes and bus priority traffic lights to speed up journey times.

6

Comments

6 They have defined random sampling.

7 This is the first data presentation technique which can be awarded.

8 They have been able to give an accurate description followed by reasoned explanation.

Pedestrian Counts

To obtain the data I used a variety of methods to make it as accurate and reliable as possible. In order for me to be able to execute the traffic and pedestrian count, I used a clicker counter along with other students from the group. After every pedestrian passes a particular point which was set prior to the investigation, the number increases per unit. This was performed in three different periods of the day - at 8:55-9:05, 11:15-11:25 and 12:55-13:05; each count was assessed over a duration of 10 minutes. The reason for using the click counter is that it was the only apparatus accessible to me and it achieves quite accurate results if used correctly.

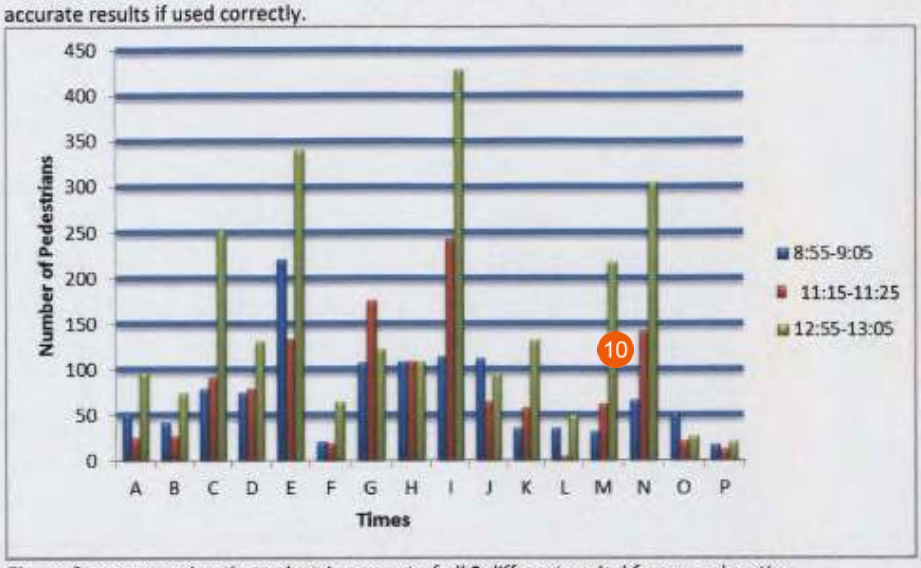


Figure 6 – representing the pedestrian count of all 3 different period for every location

This graph represents the number of pedestrians through three different periods of the day. It clearly conveys that there were more pedestrians at 12:55-13:05 in 12 out of the 16 locations in Luxembourg City which justifies my hypothesis to an extent as I had predicted part of the outcome. The highest result at this time was for location 'I' which had an amount of approximately 425 pedestrians. The lowest was at location 'P' with 20 pedestrians.

The reason behind 'I' being the highest and most frequented location at 12:55-13:05 is due to its surroundings. It is the central hub of food within the city as it is near restaurants such as McDonalds and Pizza Hut. The significance of the time is that student who attend schools within the city such as Michel Lucius and Athénée come to this area for recreational and lunch purposes. Judging from the size of the school and the amount of students they accommodate, it has a great influence on the amount of people. They are also attracted to restaurants of this nature owing to their food and price. Other influences would be employees who work in the area either in retail stores or offices nearby.

The reason behind 'N' being high is that it is situated on the 'Rue Chimay'. It is a stretch of road that contains retailers and cafés which have the highest probability of being busy at the times 12:55-13:05. This area would have a lower proportion of students to adults as a café/high-end restaurant tends to be more of an adult scene and price rather than student orientated.

7

Comments

9 There is some reference to methodology, although no justification of the times selected to take the samples.

10 Second appropriate method of presentation.

11 The learner quotes some key data. They have given reasoned explanations for peak times and have made some reference to their hypothesis.

During the times of 12:55-13:05, location 'E' had a pedestrian count of 341 as represented in fig.6. The reason for this is that surrounded the point are high-rise businesses such as the 'Societe Generale Bank and Trust'. The mass amount of people can be explained by the fact that majority of employees would be leaving towards the centre of the city for their lunch break. It is also close to the area of the CBD where many bus stops are located. This also supports the fact that 'E' has the highest pedestrian count during the period of 8:55-9:05 as people arriving to commence there day of work.

Figure 12– represents location E from the pedestrian counts (Figure 4)

8

Traffic Count

To obtain this data, as a group counts were taken across the CBD, in particular road ways – similarly to how data was collected for the pedestrian count. Again data was collected on three occasions, 8:45-8:50, 11:05-11:10 and 12:45-12:50 and all the counts were recorded using a clicker counter. Counts of just 5 minutes took place so the figures were manageable.

Figure 7 - represents the traffic count during the times of 12:45 to 12:50

The location which presents the highest amount of traffic is 'H' as it falls under the 125-150 category whereas the one with the lowest amount is 'G' as it falls under the 0-25 category.

I am using the traffic count for the period of 12:45-12:50 as the pattern was the same for each period. As displayed in fig. 7, my hypothesis has been proven due to the fact that there was more traffic recorded on peripheral ring roads in comparison to the roads situated within the core of the CBD. The reason behind this is that the ring roads have a wider range of travel options as they connect with roads beyond the CBD. They lead to areas such as Limpertsberg, Kirchberg, the railway station and beyond to the main motorways of the country; so vehicles pass through rather than stop.

Whereas with the roads situated in the core in the CBD, they only serve a far smaller purpose. Those roads are only in use when you need to access parking or occupied by delivery trucks, buses or taxis. There are pedestrianised zones and access is restricted to normal road users.

Comments

12 This is the third presentation technique used. It demonstrates some complexity as it uses layers of information and is an effective way to present this type of data. This takes presentation into Level 3.

13 The more reasoned explanation given here takes the analysis into Level 3. However, the description could be more detailed and so the awarded mark remains at low Level 3.

Customer Count

To obtain this data, as with the aforementioned pedestrian count, as a group counts were taken across the CBD at specific food outlets for maximum possible coverage of outlet type and location. 14

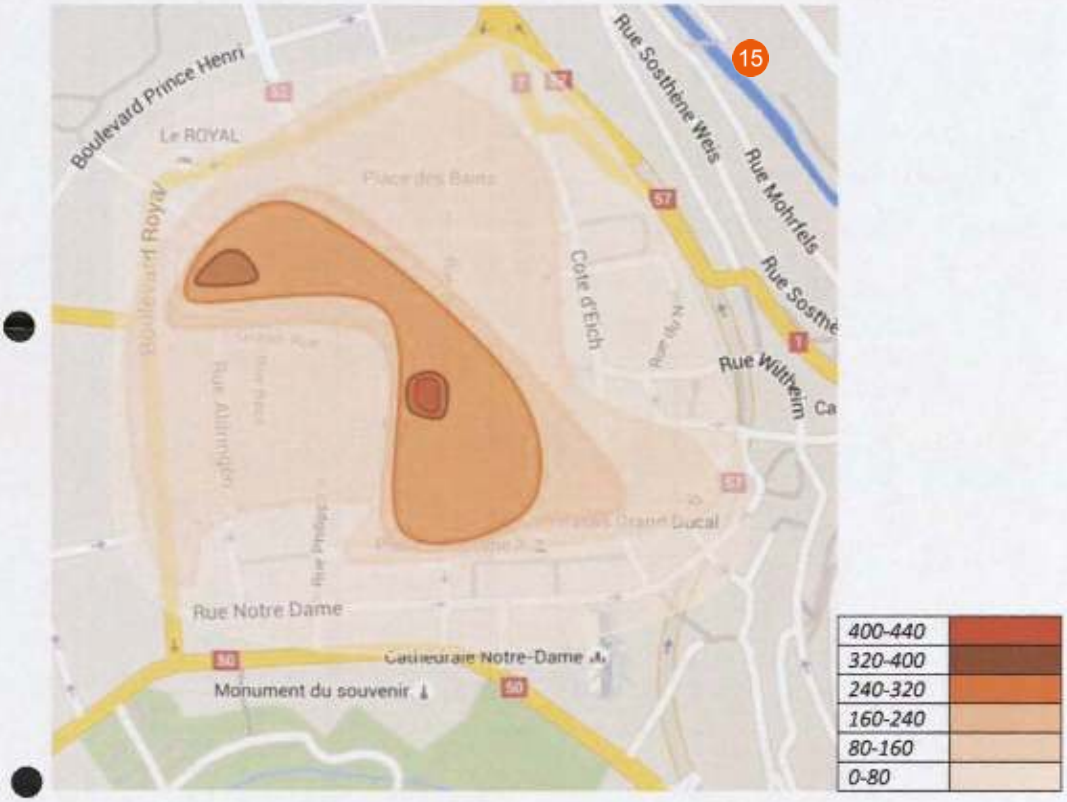


Figure 8 – represents the pedestrian count between 12:55-13:05

10

Comments

14 Here the learner justifies the locations for their pedestrian counts.

15 A further choropleth map is used, but this does not advance the response any further into Level 3 as it is the repetition of a presentation technique already used.

To obtain this data, the group were positioned in front of several restaurants and recorded the amount of pedestrians that had entered during the period of 13:15-13:25. The following restaurants were chosen: Sushi Shop, Café Francais, Brasserie du Cercle, McDonalds and Pizza Hut. During the duration of ten minutes only the pedestrians that entered were counted and not the ones that exited. This art of data collection was biased as the restaurants were picked prior to the investigation and were chosen to represent different levels of order and quality. 16

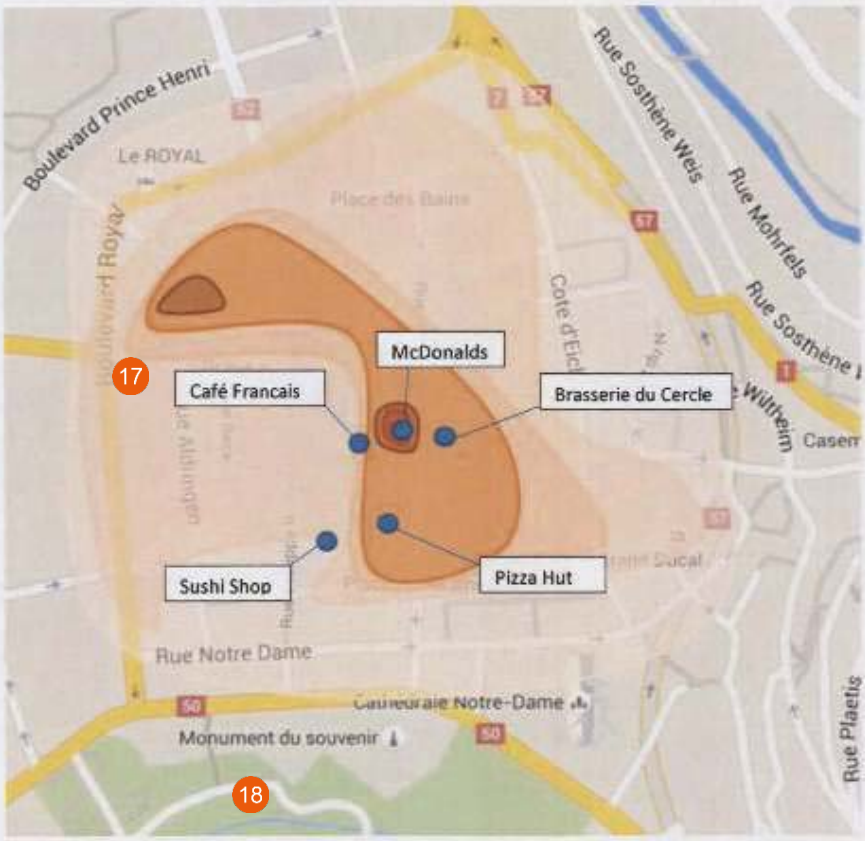


Figure 9 – locations of the restaurants superimposed on the pedestrian isopleth (Figure 9)

11

Comments

16 Here the learner makes more reference to their methodology, but the last sentence is vague.

17 The addition of the restaurant locations onto the choropleth map is effective and adds to the presentation (Level 3).

18 There is reference to methodology, but the account is not well co-ordinated within the study. Tables of data would have helped. Relevant information from a variety of sources was clearly collected and there is evidence in the presentation and use of data of sound planning. This places the study at the top of Level 2 for observation and collection of data.

Figure 10 –customer count during the times of 13:15-13:25

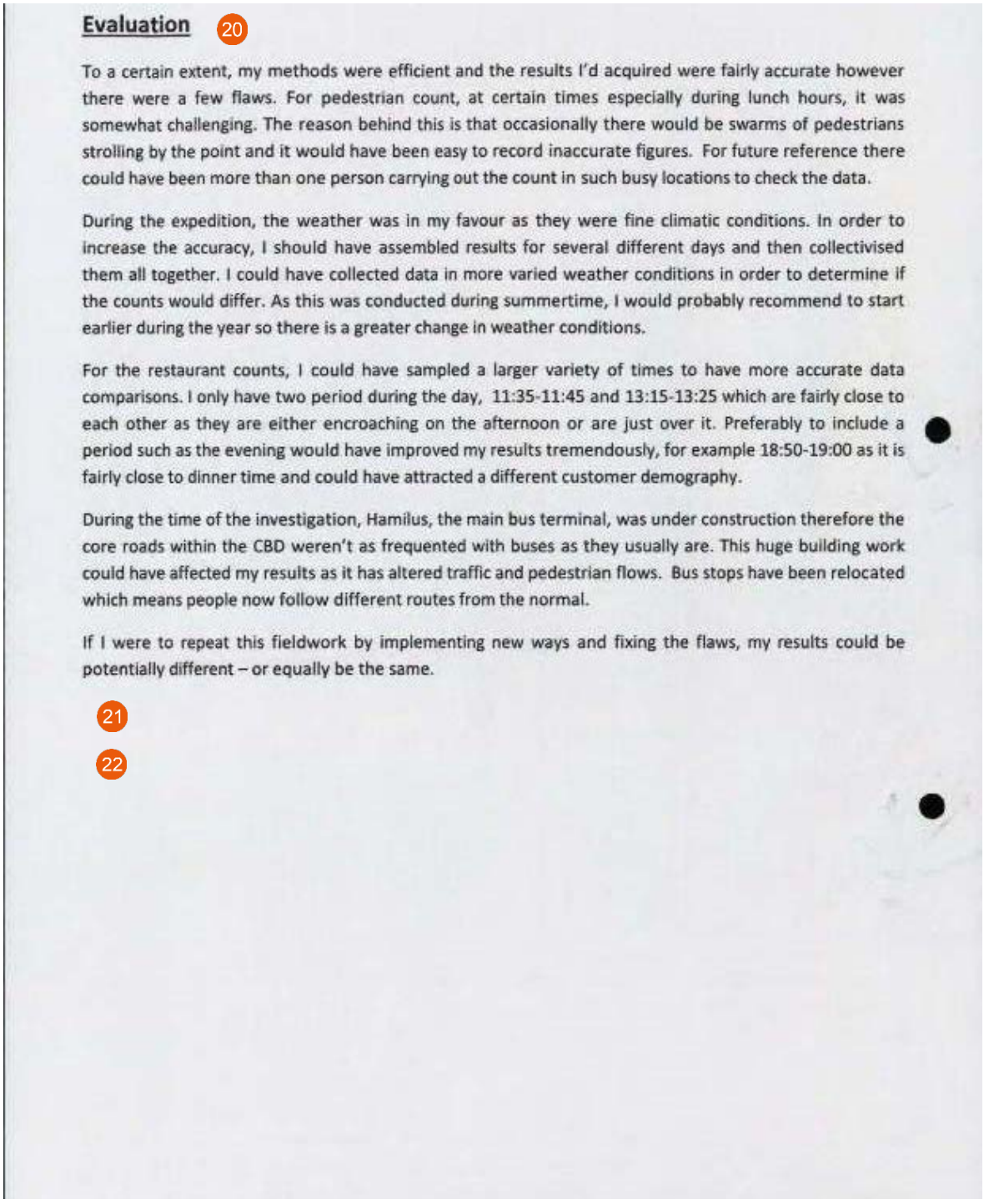
Figure 11– exterior of the Sushi Shop, an investigated restaurant

The data acquired from the customer count in fig. 10 clearly proves my hypothesis, McDonald's, falling under the category of low order fast food restaurants has the highest amount of customers during the period of 13:15-13:25. Whereas Brasserie du Cercle, falling under the category of high order restaurant presents the lowest customer count in the time mentioned previously. This data is reinforced by the results acquired by the pedestrian counts. As displayed on fig. 9, McDonalds is situated in the highest count region where 400-440 pedestrians have crossed that area between 12:55-13:05. However the isopleth conflicts the data I have collected on fig.9 to some extent. Theoretically Brasserie du Cercle should have more customers than Sushi Shop as Brasserie du Cercle is situated in a higher region on the isopleth however that is not the case. The reason behind McDona[19] popularity is that it is relatively cheap and somewhat fashionable, globally recognised which is why it is appeals to younger demographics. The significance of that is that during the period of 12:55-13:05, the majority of the pedestrians consists of students as the schools in the area have their lunchtimes which floods Place d'Armes – the central square. The reason behind the relative unpopularity of Café Francais and Brasserie du Cercle is that they charge high prices, and are more formal compared to McDonald's as it is low order. Many people, not only students, do not have the time or disposable income to eat at such restaurants.

12

Comments

19 This is another reasoned explanation, which includes an anomaly. Overall, the understanding demonstrated in the analysis takes the mark for knowledge and understanding to the top of Level 2. It cannot go further since only some use of geographical terms and limited reference to theory has been used.



Evaluation 20

To a certain extent, my methods were efficient and the results I'd acquired were fairly accurate however there were a few flaws. For pedestrian count, at certain times especially during lunch hours, it was somewhat challenging. The reason behind this is that occasionally there would be swarms of pedestrians strolling by the point and it would have been easy to record inaccurate figures. For future reference there could have been more than one person carrying out the count in such busy locations to check the data.

During the expedition, the weather was in my favour as they were fine climatic conditions. In order to increase the accuracy, I should have assembled results for several different days and then collectivised them all together. I could have collected data in more varied weather conditions in order to determine if the counts would differ. As this was conducted during summertime, I would probably recommend to start earlier during the year so there is a greater change in weather conditions.

For the restaurant counts, I could have sampled a larger variety of times to have more accurate data comparisons. I only have two period during the day, 11:35-11:45 and 13:15-13:25 which are fairly close to each other as they are either encroaching on the afternoon or are just over it. Preferably to include a period such as the evening would have improved my results tremendously, for example 18:50-19:00 as it is fairly close to dinner time and could have attracted a different customer demography.

During the time of the investigation, Hamilus, the main bus terminal, was under construction therefore the core roads within the CBD weren't as frequented with buses as they usually are. This huge building work could have affected my results as it has altered traffic and pedestrian flows. Bus stops have been relocated which means people now follow different routes from the normal.

If I were to repeat this fieldwork by implementing new ways and fixing the flaws, my results could be potentially different – or equally be the same.

21

22

Comments

20 The learner has not included a specific section on conclusions. There are some conclusions in the analysis. They have not stated whether the hypotheses are confirmed or rejected. The evaluation does refer to a range of weaknesses with some creditable solutions. This takes this element of the coursework into Level 2.

21 The fact that there is a lack of a defined methodology and conclusion prevent the organisation and presentation mark being higher than mid Level 3. The maps of the CBD of Luxembourg need a scale.

22 This is a good example of a study which needs to be read through first before any judgements are made on each of the criteria.

It is important that such studies are marked positively, crediting what the learner has done rather than penalising based on what could have been done.

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