PAPER 3: ISSUE EVALUATION & FIELDWORK

Section A: Issue Evaluation

- *AQA will send a pre-release document to Mrs Gale 12 weeks prior to the exam. This document will be a six page article on a current project occurring in the world. It will be related to at least two of the topics we have covered in Papers 1 and 2. You will have the pre-release document in your exam so you do not need to memorise it.*
- *Section A will ask you questions about the pre-release document. To prepare we will then spend 2 weeks going over the document and practising likely questions that will come up.*

Section B: Fieldwork

- *The first half of Section B is on **generic fieldwork** (pages 1 – 4). It will reference fieldworks other students have completed and ask you questions about it. For example: how should they collect or present their data, what does their data show, what is one risk of their fieldwork, how could they improve their data. You need to practice geographical skills (maps, graphs, diagrams, median/mode/mean, interquartile range…etc.*
- *The second half of Section B is on **YOUR fieldwork** (pages 5 – 11). You will be asked four questions on your human and physical fieldworks. For example: justify the location of your fieldwork enquiry, justify one data collection technique, assess the reliability of your results, justify your sampling method, assess the effectiveness of your data presentation choices…etc.*

A geographical enquiry can be split up into six stages.

- Introduction and planning
- Methods and data collection
- Data presentation
- Data Analysis
- Conclusions
- Evaluation

Enquiry Question	A question you plan to answer during your investigation. *Is coastal engineering effective at preventing erosion along the West Dorset coastline?*
Aim	A general statement of what you are trying to find out. *To compare the effectiveness of coastal engineering at Lyme Regis and Chesil Beach in West Dorset.*
Hypothesis	A testable statement (the likely outcome). *The coastal engineering strategies will be effective at preventing erosion at Lyme Regis and Chesil Beach in West Dorset.*
Risk assessment	A document that outlines the risks of completing an activity and the measures taken to reduce these risks.
Primary data	Data that is collected by yourself.
Secondary data	Data or information that has been created by another person or organisation (e.g. google, census, geology maps, OS maps).
Quantitative data	Data that can be measured and recorded using numbers (e.g. the age of your car, the number of pedestrians on a pavement).
Qualitative data	Data that records people's opinions or view (EQS, interviews, focus groups, questionnaires).
Sampling	Sampling is a shortcut method for investigating a whole population. Data is gathered on a small part of the whole and used to make a judgement as a whole.
Stratified sampling	Dividing the target population into subcategories (e.g. race, gender, religion, age). Selecting members in proportion that they occur in the population. (e.g. 2.5% of British are of Indian origin, therefore 2.5% of your sample should be of Indian origin).
Systematic sampling	Samples are chosen in a regular way. (e.g. every 2 meters along a transect line or every 10^{th} person or 10^{th} house).
Random sampling	Samples are chosen at random. Every member of the population has an equal chance of being selected (pull names out a hat)
Data collection	The process of collecting data. (e.g. wave count, pedestrian count, EQS, photographs, field sketch, land value survey).
Methodology	The strategies chosen to collect data for your investigation.
Data presentation	How you present your data. For example line graph, choropleth map, proportional circle map, bar chart, pie chart).
GIS	Geographical information systems. When you place data onto a map.
Mean	An average. Add all the values together. Divide the total by the number of values added.
Mode	The most common value.
Median	The middle value.
Range	Minus the lowest value from the highest value.
Interquartile range	Organise the data points from highest to lowest. Find the median. Find the median of the upper half of results (upper quartile) Find the median of the lower half of results (lower quartile) Minus the lower quartile from the upper quartile.
Conclusions	Does your data answer your enquiry question. Overall…..
Reliability	Refers to the degree to which repeated measurements give the same result. To get more reliable results repeat the test and take an average.
Accuracy	Refers to the whether your data achieves the correct result. To get more accurate results use accurate equipment.

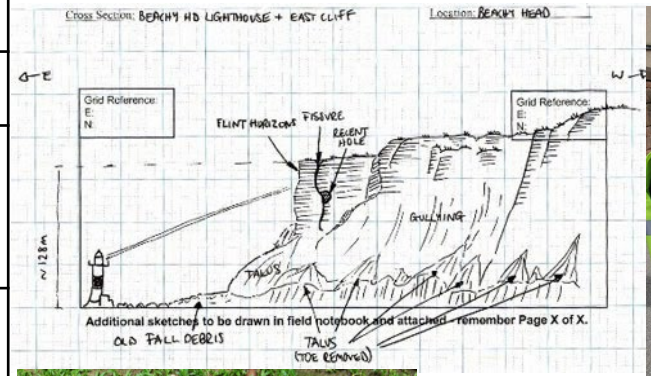
Methodology/Data Collection

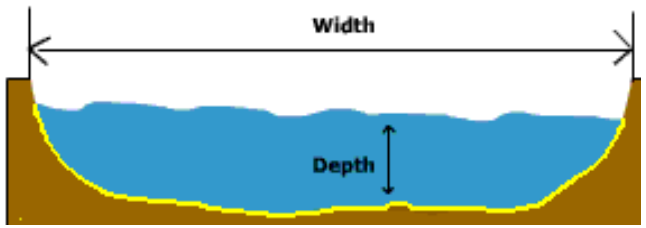
TECHNIQUE	WHAT IS IT USED TO MEASURE
FIELD SKETCH	Field sketches are a simple drawing or sketch of a site, showing its key features. *e.g. they can show the different sea defences and coastal management plans at each site or they can show the key characteristics of two sites. These could then be used to compare two locations.*
BIPOLAR EVALUATIONS	Bipolar evaluations measure our own opinion using a scale of . *E.g. an environmental quality survey. This uses an observer's judgement to assess environmental quality against a range of indicators (e.g. graffiti, building quality, damage to pavements, number of green spaces…etc.). They work on a scale (+5 to -5).*
RIVER VELOCITY	Measures the speed of the water flow along the river. ➢ *How quickly is material transported along the river?* ➢ *How does river velocity impact on river processes?*
WAVE COUNT	Wave counts measure the number of waves that break in a minute. They are used to measure if the waves are constructive or destructive.
LAND VALUE MAPPING	Working out the value of the land at a specific location.
BEDLOAD SIZE	The size and shape of pebbles on the beach or on the river bed.
QUESTIONNAIRES/ SURVEYS	People answer questions based on their opinion on the location.
PEDESTRIAN / TRAFFIC / LITTER COUNTS	• A pedestrian count is used to measure footfall (number of people passing by). • A traffic count records the number of cars that are in a location. • A litter count records the amount of litter in a location.
WIDTH OF RIVER DEPTH OF RIVER	Measure how wide and deep a river is at specific points along a river's long profile.
QUADRAT SAMPLING (DONE IN BIOLOGY)	Shows the number of different species in a location (biodiversity). It would be impossible to count all the plants in a habitat, so a sample is taken. A tool called a **quadrat** is often used in sampling plants.
WIND SPEED AND DIRECTION	Wind speed and direction.
DUNE PROFILES, SAME AS BEACH PROFILING	Succession Transects The aim of dune profiling is to investigate the structure of the dune system from the fore dunes (most recently formed).

		What is it used to measure
SECONDARY DATA	OS map	Ordnance Survey maps show a detailed picture of the land. We used both 1:25,000 and 1:50,000 scale maps
	Historical maps	Historical maps show the area 50-100 years ago. They can be compared with todays maps for the changes.
	Sea defence information	Information about sea defences, from local authorities and DEFRA.
	Average house price	The average house price is released by the HM land registry. It combines the house prices of all recently sold houses and divides by the number of houses, making an average.

Labels

Annotation



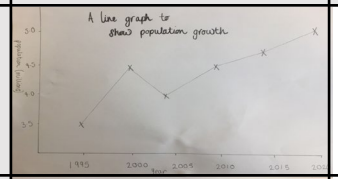
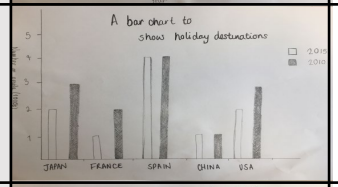
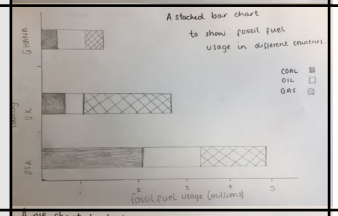
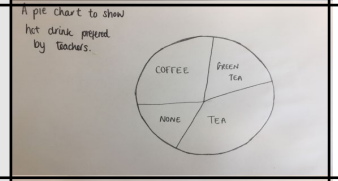
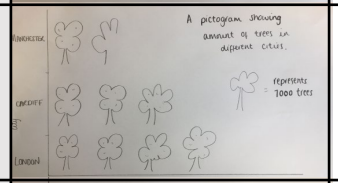
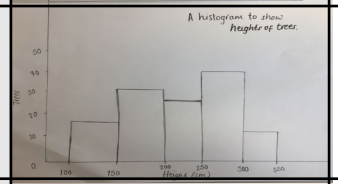
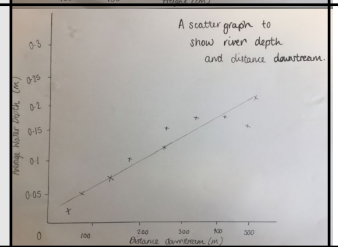


Environmental Quality Index

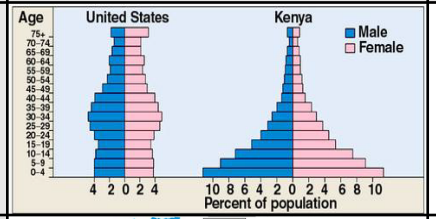
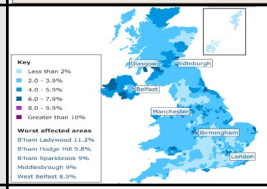
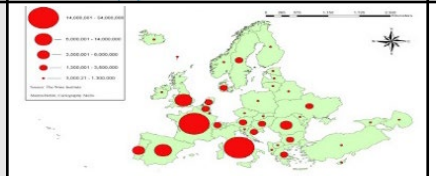
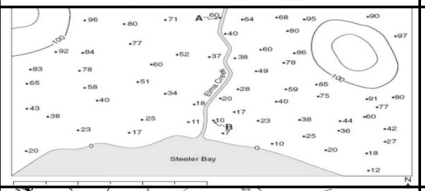
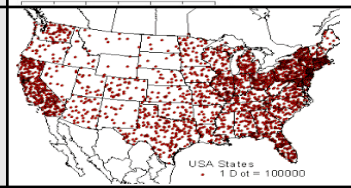
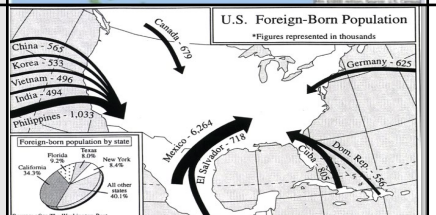
Date: Time: Location:

POSITIVE ASPECTS	+2	+1	0	-1	-2	NEGATIVE ASPECTS
High pedestrian count						Low pedestrian count
Low traffic count						High traffic count
Odourless						Unpleasant smells
Little/no air pollution						Considerable air pollution
Pleasant/attractive buildings						Unpleasant/unattractive buildings
Pleasant surroundings to buildings						Buildings in poor state of repair
Well tended and cared for buildings						Unpleasant surroundings
Quiet						Noisy
Some/much greenery						No greenery
All buildings used						Some boarded up or empty buildings
Upper stories well cared for						Upper stories not well cared for
Little litter						Much garbage
Safe for young/elderly						Unsafe for young / elderly
Disabled facilities						No disabled facilities

Data Presentation: graphs, maps, pictograms…etc.

GRAPH	EXAMPLE	DESCRIPTION OF GRAPH	WHAT DATA IS IT APPROPRIATE FOR?
LINE CHART		A line chart or line graph shows continuous changes in data over time. • A straight line joins data points on a graph.	• Traffic flows • Population Change • Height of sediment (groyne profile)
BAR CHART		A bar chart or bar graph is a graph where data is shown by rectangles that are drawn to a certain length (height).	• Number of people/ animals in certain locations. • Bipolar analysis
DIVIDED BAR CHART OR STACKED BAR CHART		Similar to a bar chart/graph as the data is shown using rectangles that are drawn to a certain length. However in a divided or stacked bar chart the rectangle is subdivided into different categories. *e.g. the graph shows different countries and their use of fossil fuels. The total length shows the total use of all fossil fuels, however the colours show the use of oil, gas, coal.*	• Data with a number of different subdivisions.
PIE CHARTS		A circle is divided into sectors that represent a proportion of a whole. To draw a pie chart, we need to represent each part of the data as a proportion of 360°, because there are 360° degrees in a circle.	• Questionnaire data with specific answers.
PICTOGRAMS		A pictogram uses pictures to represent numerical data. *e.g. the number of trees in a city is represented by the number of trees shown.*	• Number of cars, pedestrians, animals in a certain area.
HISTOGRAM		A histogram is similar to a bar chart, but a histogram groups numbers into range along the X axis. This uses continuous data. *Eg. If the tree is 225cm tall it will be added to the 200-250 range.*	• Waiting times • Amount of people or animals in a certain area. • A pedestrian count.
SCATTER GRAPHS/ DISPERSION GRAPHS		A scatter graph (also called a scatter plot/chart/graph/diagram) show a number of data points plotted onto a graph. They usually show the relationship between two variables. *e.g. how does life expectancy change as GDP increases?* • Positive correlation: the data points start low and then begin to rise up the Y axis • Negative correlation: the data points start high and then sink down the Y axis	• Continuous data that could potentially link with other data.

Data Presentation: population pyramids, GIS, maps, proportional circle maps, flow lines…etc.

MAP	EXAMPLE	DESCRIPTION OF GRAPH	WHAT DATA IS IT APPROPRIATE FOR?
POPULATION PYRAMID		A population pyramid shows a population's structure. It can be done to show the population of a continent, country, town, city, village…etc. A population pyramid breaks the population up into 5 year groups *(0-4, 5-9).* It shows the number of males and females alive in each 5 year group. *(e.g. the number of men aged 0-4 or 10-14 or 25-29).*	Populations (humans or animals) in an area.
CHLOROPLETH MAP		Different colours, shades or symbols are used to represent data. Allows you to see similarities and differences. *e.g. the darker shades indicate higher population density.* *e.g. the lighter shades indicate high altitude (height above sea level)* *e.g. different colours are used to indicate 100% of the population with access to clean water.*	Population density Altitude Access to clean water
PROPORTIONAL CIRCLE MAPPING		The circles are used to show data. The size of the circle indicates the value/amount of data it is representing. *e.g. the bigger the circle, the larger the population size* *e.g. the bigger the circle, the higher their release of greenhouse gases.*	Wave counts Total bipolar scores
ISOLINE MAP		Isolines are lines drawn to link different places that share a common value. They help patterns or links to be seen within data sets. *e.g. contour lines on a map join points of equal height. They allow you to easily see the gradient. Lines close together = steep.*	Contour lines Isobars lines that show air pressure.
DOT MAPS		Each dot represents a certain piece of data/information (e.g. population). Map Dot maps show spatial patterns. *e.g. in a population distribution map, each dot represents a certain number of people (e.g. 1 dot = 100,000 people). You can easily see where most people live.*	Population distribution Where people died in London following the Black Death.
DESIRE LINES		A desire line diagram shows the movement of a product from one place to another. Each line joins the place of origin and destination of a particular movement. *e.g. where a country imports and exports its goods.* *e.g. where an airline flies to and from.*	Imports and exports
FLOW LINES		Flow line maps show a movement/flow of a product or group. The line is drawn from the place of origin to the point of destination. The thickness of the line represents how many of a product or group moves. *e.g. flow of migrants between or within countries.* *e.g. flow of traffic along roads.*	Imports and exports Immigration/ Emigration Transport links

Our Fieldwork

- You need to know these back to front.

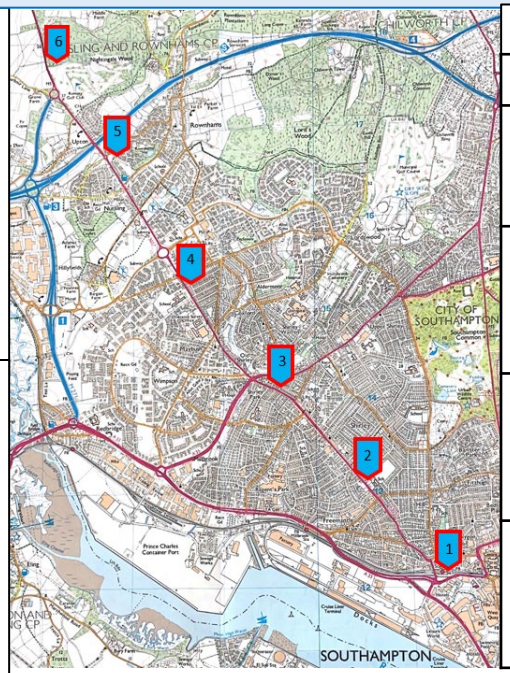
Human Fieldwork - How does environmental quality change as distance from Southampton City Centre/ CBD increases?

Enquiry Question:
How does environmental quality change as distance from CBD increases?

Hypothesis
As distance from the CBD increases, environmental quality increases.

Aims:
- Determine if environmental quality increases as you move away from the CBD of Southampton.

Method
Transect along A3057 – 30cm from West Quay to Roundhams – 5000m
4cm between each point = 1000m – systematic sampling
At each location we collected the following data:
- Environmental Quality Survey.
- Average decibel reading.
- Litter tally count.



Risk assessment

Risk	Level of risk	Actions taken to reduce risk	Level of risk after actions
Minibus crash resulting in injury or death	High	Seatbelts to be worn Teachers monitor student behaviour Adult qualified to drive the minibus	Low
Students get run over whilst collecting data along the A3059	High	Students stay on the pavement. Use crossings if need to cross roads. Stick to sides of pavements and walk in single file lines.	Low
Students trip over and injure themselves	Medium	Wear sensible shoes Don't go on phones when walking to each location so students look where they are going.	Low
Students get lost	Medium	All students given a map. Stick together as a group. School mobile number given to students to ring in an emergency.	Low

Data Collection method	Description of technique	Advantages	Problems	Improvements
Environmental Quality Survey	A variety of different variables including: design of buildings, if there were green spaces, if repairs were needed were given a score from 1 (worst) -5 (best). The total environmental quality survey score was then calculated for each location.	Easy to understand. Quick to complete. Does not require complicated equipment.	Subjective to personal opinion.	Could have asked multiple people to fill it out and created an average score = more reliable data.
Average Decibel reading	Using the decibel app on our phones we recorded the average decibel reading over 1 minute. We repeated this twice per location and calculated the average score.	Quick and easy to complete. By repeating it the results were more reliable.	Recorded students making noise so the readings could have been in correct. Students could have misread the app (human error).	Make sure that everyone is silent whilst recording the data. = improved accuracy. Carry out at different times of the day and calculate an average score = more reliable data.
Litter tally count	We noted down a line for each piece of litter we could see at each location.	Quick and easy to complete. Does not require complicated equipment.	Students might not have spotted all the litter - Human error. Confusion as to what to count, should we count every single cigarette butt?	Clarify what to count – count every single cigarette butt = more accurate data. Carry out litter tallys at different points of the day = more accurate.

Environmental Quality Survey

Buildings	1	2	3	4	5	
Badly designed/ugly						Well-designed/ pleasing to the eye
Derelict or requires many repairs						Little to no repairs needed
Buildings look out of place or mismatched						Buildings match the surroundings
Buildings are dirty or covered in graffiti						Clean buildings with no graffiti
Total score:						

Traffic	1	2	3	4	5	
Parking is difficult – Many vehicles parked on road						Parking in garages or driveways
Air smells heavily of traffic fumes						No smell of car fumes
High noise volume from traffic						No traffic noise
No pavements for people to walk on						Well maintained pavements for people to walk on
Total score:						

Open Spaces and Gardens	1	2	3	4	5	
No gardens/open spaces – doors open to street						Large gardens or open space outside houses
Garden/ open space in poor condition						Garden/ open space in good condition
No greenery visible						Trees/ shrubs/ greenery visible
No public parks						Public parks easily accessible
Total score:						

Total Environmental Quality Index Score: _____

Background noise (record the background noise for 1 minute).

Average Decibel Reading 1: _____

Average Decibel Reading 2: _____

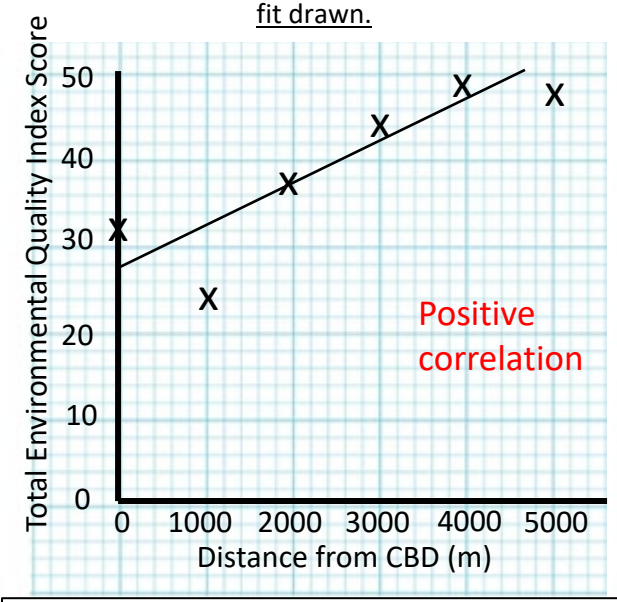
Combined Average Decibel Reading: _____

Litter Tally count:

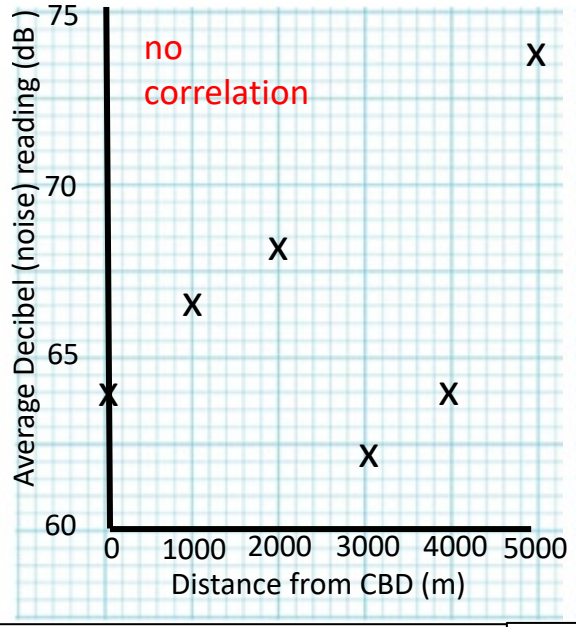
Human Fieldwork - How does environmental quality change as distance from Southampton City Centre/ CBD increases?

Data Presentation

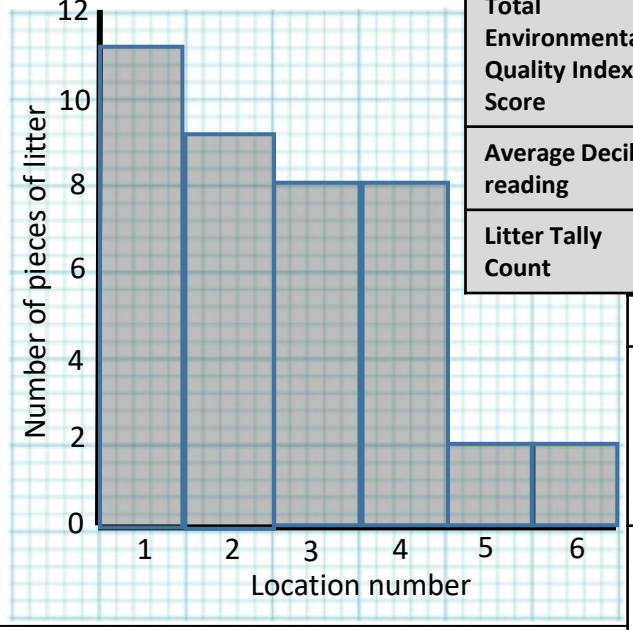
Total environmental quality score as distance from CBD increases scatter graph with line of best fit drawn.



Scatter graph showing noise levels against distance from CBD



Bar graph showing litter at each location



Location (distance from CBD)	1 0m	2 1000m	3 2000m	4 3000m	5 4000m	6 5000m
Total Environmental Quality Index Score	33	24	37	43	49	48
Average Decibel reading	63.5	66.5	68.9	62.1	64.7	74.2
Litter Tally Count	11	9	8	8	2	2

Data presentation method
Scatter graphs with line of best fit – Used to compare two sets of continuous data. Easy to construct, can show correlation between two data sets, any anomalies stand out. Can't label data points, too many points can make it hard to read, too few points can skew the results.
Bar graph – Used for absolute values (e.g. categories on x axis) and can be used to show differences between locations. Good visual representation of data. Simple to construct and easy to understand. Can only be used with discrete data (categories).

Conclusions

From the environmental quality survey we can conclude environmental quality improves away from the city centre. More specifically at the locations closest to the CBD the scores were only 33 and 24, where as at the furthest two points the scores were highest at 49 and 48. Therefore factors like buildings, traffic and open spaces improved away from the CBD.

For noise pollution we can conclude there was no correlation between the amount of noise and distance from the city centre. More specifically the decibel readings ranged from 62 to 74 dB. As a result this does not support our hypothesis.

The amount of litter decreased as distance from CBD increased. More specifically there was most litter (11 pieces) in the city centre and only two pieced 4000 and 5000m away. This shows that litter decreased and so supports our hypothesis

Overall the aim of the fieldwork has been met as we successfully collected data to test our hypothesis. As a result of this data we can accept the hypothesis as both the environmental quality index survey and litter tally count support the environmental quality increasing as distance from the CBD increases.

Evaluation

Accuracy – are the measurements correct?

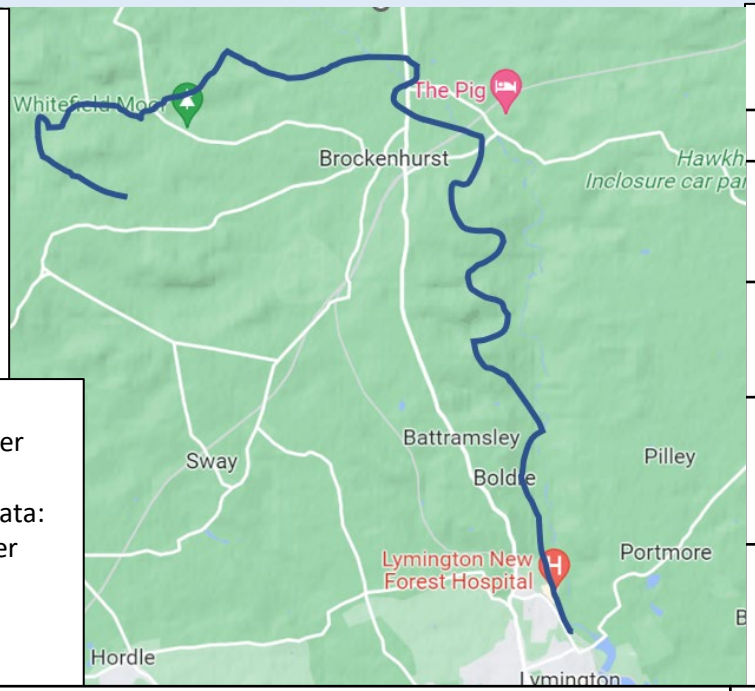
- Improve Environmental quality survey by asking more people to complete it so not just own opinion – this would also make it more reliable as it would be repeated.
- Improve Decibel readings by ensuring all students are silent when readings are taken so that no background noises are recorded.
- Improve decibel reading by being careful reading app so that no human errors are made.
- Could use a decibel reader not just an app on a phone so that the data is more accurate.
- Make sure students are clear on what counts as litter and know to record every single small piece.

Reliability – Would the results be the same if it was repeated?

- Repeat the fieldwork at different times of day so that it is reliable for all times of day not just during the school day. E.g. there might be more noise or litter during rush hour.
- Repeat the fieldwork on different days of the week. E.g. the city centre could be noisier at the weekends.
- Repeat the fieldwork at different times of the year. E.g. spring, winter, summer, autumn. Litter could be affected by seasons.

Physical Fieldwork – How does the Ober Water River change as you move downstream?

Enquiry Question: How do the characteristics of the Ober Water river change as distance from source increases.
Hypothesis: The river will become deeper, wider and faster as the distance from the source increases.
Aims: To collect data along the Ober Water that can be used to show how the river's characteristics change as the distance from its source increases.



Method
Data collected at various points along the Ober Water River in the New Forest.
At each location we collected the following data:

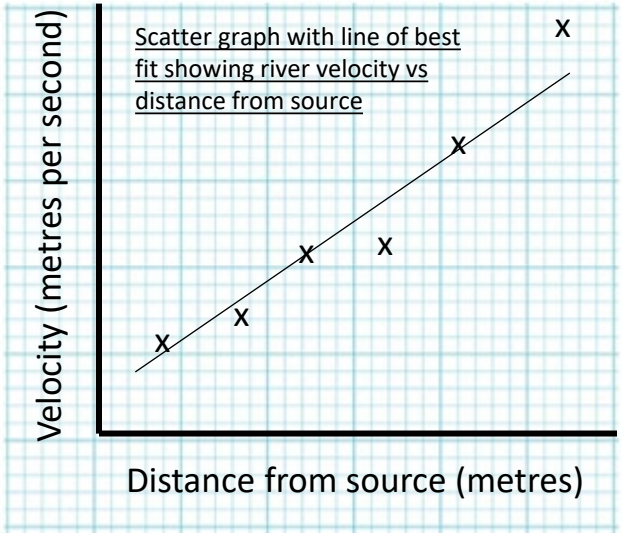
- Cross section of the river (including river depth and width).
- River velocity (speed)
- Field sketch

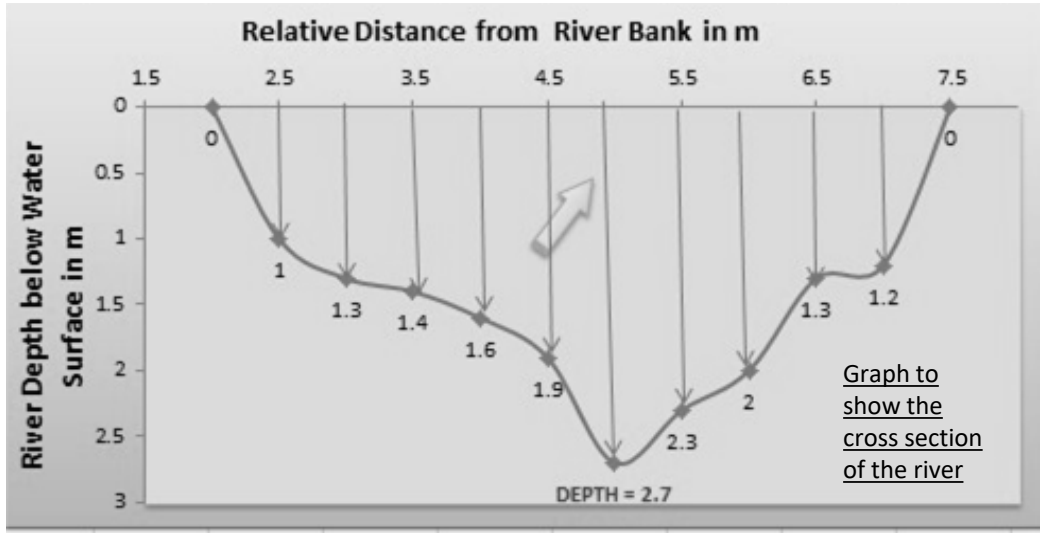
Risk assessment

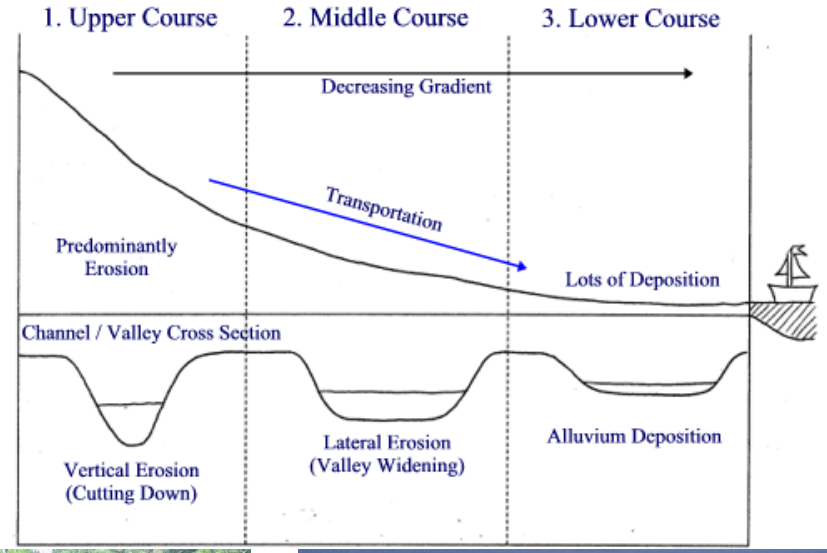
Risk	Level of risk	Actions taken to reduce risk	Level of risk after actions
Coach crash resulting in injury or death	High	Seatbelts to be worn Teachers monitor student behaviour Adult qualified to drive the coach	Low
Students drown in river	High	No students to enter water unsupervised. Only enter areas which are safe to collect data in.	Low
Students trip over and injure themselves	Medium	Wear sensible shoes Don't go on phones when walking to each location so students look where they are going.	Low
Students get sunstroke or hypothermia	Medium	Sensible clothing must be worn. Water should be brought by all students. Hats and sunscreen if it is sunny. Coats of cold and wet.	Low

Method of Data collection	Description of data collection technique	Positives	Negatives
Cross section of River	Hold the measuring tape tight and horizontal from one river bank to the other. At each measurement site put a metre rule into the water until it touches the bottom Read and record the distance from the tape to the ground At the same place, read and record the depth of the water. Start at 0m and repeat every 1m, or 10 times equally across the width. Finally, hold the measuring tape just above the surface to measure the exact width of the water (occupied channel width)	- Low tech, only requires graph paper, tape measure, ranging poles and measuring stick. - Graph is drawn as data is collected. - Can be completed in 10 minute or less across a smaller stream.	- Requires you to get into the river which could be dangerous. - Needs 4 people to take measurements and draw one cross section. - Human errors could be made when measuring the depth or calculating the depth of the river.
River velocity	Find the direction of water flow Two people stand in the water, exactly two metres apart in the direction of water flow. One person drops the floating object and shouts start The second person shouts stop, as soon as the object has passed them A third person uses the stopwatch and writes the time down	- No high tech equipment required, just biscuits, 1m ruler and a stop watch. - Not too time consuming to complete	- Possibility of human error when working out speed using distance/time calculation. - Required 3 people. - Difficult to collect data in areas of deep water. - Possibly dangerous if the velocity of the water is too high.
Field sketch/ Photographs	Draw a sketch of the river at each location.	- Quick to complete - Only requires pen and paper. - Can easily add labels.	- May not be accurate. - Hard to complete if it is raining or windy. - Only show one view at one point in time (photos or videos could be better)..

Physical Fieldwork - How does the Ober Water River change as you move downstream?







Filed sketches were made by students of the locations on the right

Conclusions

By measuring the rivers velocity at varying points from the rivers source we can see that the rivers speed increased further from the source. More specifically, there is a positive correlation between the velocity and distance from the source.

We can also conclude that the river becomes wider and deeper as the distance from the source increases. More specifically we can compare our filed sketches and cross section diagrams for points in the upper, middle and lower course. As a result these show the river becoming deeper and wider as distance from the source increases.

Overall the aim of the fieldwork has been met as we have collected data which allowed us to compare how the characteristics of the Ober Water changed as distance from source increased.
As a result we can accept the hypothesis that as distance from the source increases, the river gets faster, wider and deeper.

Evaluation

Accuracy – are the measurements correct?

- Students should be more careful when reading cross section heights to avoid misreading tape measure.
- Students should be careful not to stand in flow of river when measuring velocity.
- Photos or videos might have been more accurate than field sketches.

Reliability – Would the results be the same if it was repeated?

- Repeat the fieldwork at different times of the year. E.g. spring, winter, summer, autumn as the rivers characteristics could be affected by seasons.

Examples of other peoples fieldwork

- You don’t need to learn these but similar examples could come up in the exam that you could be asked about.
- There are some good examples of data presentation methods.

PHYSICAL FIELDWORK: Is coastal engineering effective in managing erosion along the West Dorset Coastline?'

WHERE WE WENT:

We visited two locations along the West Dorset coastline: Lyme Regis and Chesil beach. The county of Dorset is located on the South coast of the UK.

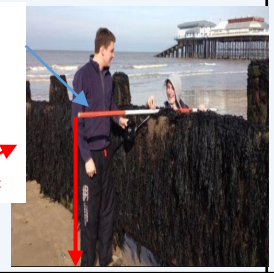
WHY WAS IT SUITABLE?

- The location was suitable as it is only a 3 hour drive from school.
- The centre where we stayed was able to provide us with expert guidance on locations in West Dorset as well as the equipment we needed.
- There is evidence of erosion on the West Dorset Coastline.
  - *The underlying rock is clay, which is soft and erodes very quickly.*
  - *The fetch is the distance the waves travel before they reach the coastline. In West Dorset, the waves travel over 4000 miles across the Atlantic = very strong destructive waves are common here.*
- In West Dorset there are two locations which use different coastal management strategies to protect their coastline. This allows us to compare the effectiveness of the strategies at each site.

❖ RISK ASSESSMENT FOR THE THREE STUDY SITES

ACTIVITY	THE RISK	HOW CAN WE REDUCE THE RISK
Walking to each site where there are uneven and slippery surfaces	Slips, trips and falls	• Wear appropriate footwear • Avoid wet slippery rocks • Always follow footpaths, follow instructions of teachers and leaders.
Collecting data on the beach.	Rising tides, drowning.	• Always stay 5 meters away from water's edge at all times • Group leaders check tide times • Group leaders have knowledge of where the safe areas are.
Collecting data on the cliff tops.	Falling off the cliff top, slipping.	• Group stays 5m away from edge of cliff
Being in the outdoors: cold, wet weather.	Colds, flu and hypothermia	• Check weather forecast before visit • Students have appropriate cold weather clothing • Students have breakfast lunch and dinner
Walking along busy roads	Danger of traffic, crossing busy roads	• Always stay on pavement • Use designated crossings • Wait for green man to cross road

❖ DATA COLLECTION METHODS

	Description and our methodology (how we collected the data)	Why it is appropriate?	Limitations and how we can improve
PRIMARY	**A field sketch** is a simple drawing or sketch of a site, showing its key features. 1. I chose a location where I could see as many engineering structures as possible. 2. I drew the outline of the defences and then added detail. 3. I annotated the drawing, describing in detail each feature I drew. I also included the the date, time, weather conditions and compass direction. We used **stratified sampling**. We carefully choose where to stand, to ensure the sample area represented the whole. This is appropriate as it ensures we drew all the coastal management strategies.	It is appropriate because it allowed us to record the coastal management structures at each location so that we can compare the two locations. It also recorded the day's weather conditions, helping us to explain our other data (e.g. weather affects wave count data).	• The same site could look completely different within an hour of time or in the morning and afternoon. It is affected by the tide, weather conditions or direction you draw the field sketch. *For example in the morning the tide could be low and then in the afternoon, the tide could be high = different field sketch of the same site.* • It is based on your ability to draw. **Improvements** • I could take a panoramic photograph and annotate this.
	Wave counts are used to categorise the waves. 1. I selected a point in the sea where the wave were breaking (turns white) 2. I started the stop watch and counted the number of waves that broke at my chosen point within 60 seconds. 3. I decided if the wave were constructive or destructive using these categories. • *11-15 destructive waves break every minute* • *6-9 constructive waves break every minute.* 4. I repeated this process three times and worked out the average We also used **random sampling** as we selected a random point where they waves were breaking to start our counting.	To measure the effectiveness of coastal management structures against erosion, erosion must occur along the coastline. This test allows us to quickly and reliably check whether the waves are destructive and therefore erosive. We repeated the test 3 times and worked out an average = more reliable. The same person counted the number of waves each time.	• Weather can influence the data. If there is a storm/strong winds it will make the waves look more destructive than they normally are. The conditions could change throughout the day. A recording in the morning might be different than a recording in the afternoon. • Human error **Improvements** • Repeat the wave count more than 3 times = more reliable. • Repeat the test at different sites along the beach = more accurate measure of wave type. *e.g. every 100metres along the beach.* • Repeat the test another day (*each month) will increase accuracy*.
	A groyne profile measures the build-up of sediment on either side of the groyne. 1. In groups of 3 we placed a 2m long ranging pole horizontally across the groyne at a right angle to the groyne. 1m was to the right of the groyne and 1m was to the left of the groyne. 2. We used a tape measure to measure the distance from the end of the ranging pole to the ground on either side of the groyne. This showed us the height of the sand on either side of the groyne. 3. We repeated this test, every 2m up the groyne. We used **systematic sampling** as we used the ranging pole to measure every two metres up the beach. 	It is appropriate as it allows us to quickly determine whether a groyne is effective. Effective groynes trap sediment being transported by longshore drift. Therefore, if there is more sediment on one side of the groyne than the other, the groyne is effective.	• Human error: some people might stretch the tape measure tighter than others others may have the tape very lose or twisted = different measurements recorded. • Water and rock pools often build up at the base of groynes, this can prevent people from being able to take a measurements. • High tide can prevent measurements from being taken. **Improvements** • Repeat the test along more than one groyne. • Repeating the measurements over time will increase the reliability of the data. (e.g every week or month)
	Environmental Quality Survey is a survey that measures your opinion on the environment at each site. 1. Decide where to stand - where you can see most of the defences you are investigating. 2. Read each statement and decide which score should be given for that statement. 3. Add them up to create a total score for your first site sea defence/location.	It is appropriate as it helps me identify the differences in several aspects of the quantity and quality of the coastal management structures used at each site. I can then use this data to compare the effectiveness of structures at each site.	• It is subjective and can be biased on your personal opinion. • Only assesses on a limited amount of criteria. Certain aspects of the environment may be missed. • On different days the location might look different. **Improvements** • Complete the EQS at different sites within one area to gain a better overall picture of the area. • Compare scores between groups to reduce subjectivity and bias.
SECONDARY	**Maps**: ➢ **GEOLOGY MAPS** were used to show us the rock type = clay. ➢ **OS MAPS** were used to help us locate where along the coastline had coastal management structures. ➢ **HISTORICAL MAPS** were used to show the historical rate of cliff retreat.	**LIMITATIONS** • No map is entirely accurate, they are most accurate if they are showing a small area.	

❖ DATA PRESENTATION

To present our field sketch we drew an annotated field sketch.

It is appropriate as it allows us to record the different types of hard & soft engineering used at each beach. We were also able to focus on the elements that were relevant to our enquiry (coastal management) and remove irrelevant elements (humans/dogs). We also included the conditions of the day (weather, time…etc.) as these factors affect our data.

On the other hand it is based on our ability to draw. An alternative presentation technique would be to use an annotated photograph.

To present our wave count data we used a proportional circle map. The size of the circle indicates the value of data it is representing. *The bigger the circle, the more waves per minute.*

We placed the proportional circles on a satellite photo of the two beaches. We also included the number of waves per minute in each circle. This is a very visual method, making it easy to identify where there are constructive or destructive waves.

To present our groyne profile data, we used an inverted bar chart. A bar chart with EAST and WEST data shown next to each other is best to show the sediment build up on either side of the groyne. The bars are inverted (turned upside down) to show the measurement we completed.

It is appropriate as it is very visual. The top of the bar chart represents the top of the groyne. The bottom of each bar represents the top of the sediment on either side of the groyne. Each side of the groyne is represented by a different colour making it very easy to compare each side.

An alternative data presentation method could be to use a line graph, with each side of the groyne being represented by a different colour.

To present our environmental quality survey data, we used a radar graph. They plot multiple sets of data (for each sea defence) over common variables (adaptability, durability, aesthetics…etc.).

It is appropriate as it allows you to very easily compare data. Many values at each site can be compared against each other. You can also easily compare values between sites.

On the other hand they can be confusing with the multiple lines that overlap each other. An alternative method could be a multiple series bar chart with each sea defence represented by a different colour.

❖ ANALYSIS

Field sketch at Lyme Regis:

- Sea defences include: flat sea wall, curved sea wall, rock armour, groynes, beach nourishment.
- There was evidence of slumping (mass movement) next to the town, where there was no coastal management, however very little evidence of erosion in Lyme Regis where sea defences were used.

Field sketch at Chesil Beach:

- Sea defences include: curved sea wall, natural rock armour (scree from rock fall), revetments and beach nourishment.
- There was evidence of rock fall behind the sea defences with the scree creating natural rock armour.

Wave count at Lyme Regis shown in the proportional circle map:

- Number of waves recorded : 13, 12, 14 = average of 13 waves per minute = destructive waves.

Wave count at Chesil Beach shown in the proportional circle map:

- Number of waves recorded : 13, 14, 14 = average of 14 waves per minute = destructive waves.

Groyne profile at Lyme Regis

- The bars are shorter on the east side of the groyne. This means that there is more sediment on the east side of the groyne than the west.
- More specifically at 14 meters along the groyne, the distance on the east side of the groyne was 105cm, whereas the distance on the west side of the groyne was 150cm.
- This shows that the groynes are effective at preventing the movement of sediment by longshore drift = the beach becomes larger.

EQS at Lyme Regis:

- There is a lot of hard engineering = the impact on the environment scored low, however for effectiveness the overall score was v. high.
- The highest scorers were rock armour & curved sea wall, which scored the +3 for effectiveness and durability, as they are made of granite & concrete. On the other hand they scored low for cost (1) due to high initial costs & rock armour scored -3 for adaptability as they do not have a secondary purpose.

EQS at Chesil

- All coastal management scored well, however not as high as Lyme Regis. Soft engineering (beach nourishment) scored the highest for aesthetics, durability, adaptability & impact on environment.
- Gabions look fantastic from the beach, however there is rusting on the wires on the top of the gabion which can be dangerous.
- The flat sea wall also scored well however has a lower score on the impact on environment.

❖ CONCLUSIONS

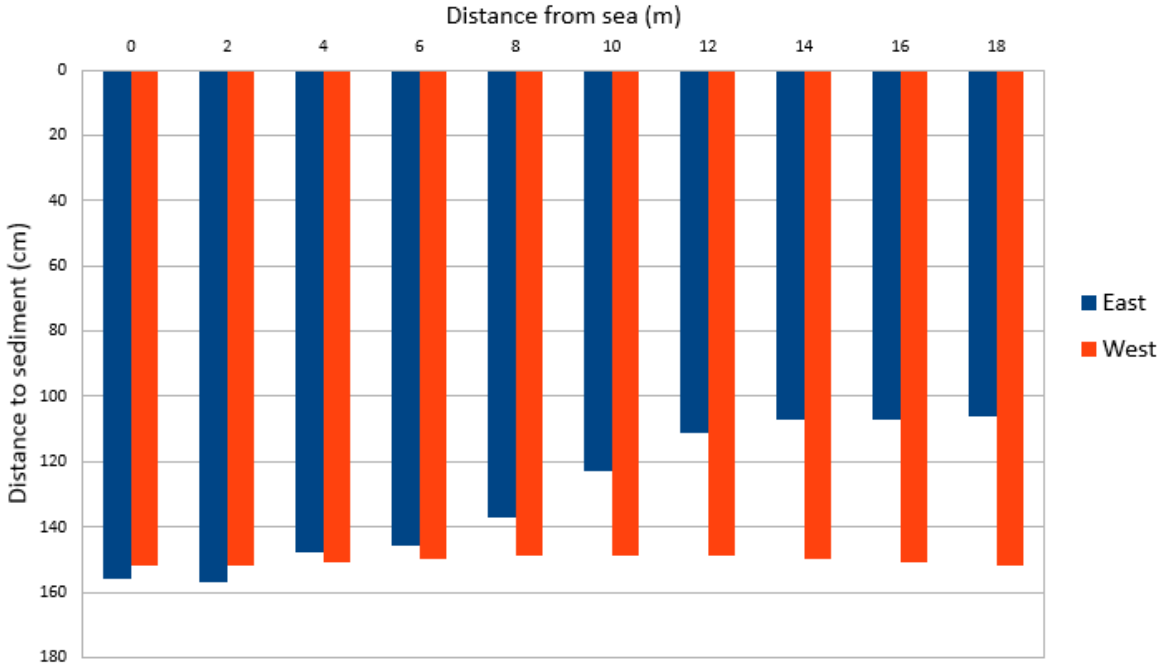
Overall coastal engineering is effective at both Lyme Regis and Chesil Beach, however is slightly more effective at Lyme Regis.

- **Lyme Regis is at risk of erosion due to the destructive waves and the soft rock . More specifically, the wave count recorded that the average wave count is 13 waves/minute evidencing they are destructive. Furthermore the geology map shows that the underlying rock type is clay (soft rock). Having said this, the field sketch shows little evidence of erosion in Lyme Regis. This is in large part due to the high number of coastal defence structures at Lyme Regis shown in the field sketch. These include a curved and flat sea wall, rock armour, groynes and beach nourishment. The radar graph showed my opinion on the effectiveness and condition of the coastal defences. Overall the coastal defences scored very highly, with all defences scoring about 2 for *effectiveness* and *durability.* The high number of hard engineering strategies, however, did mean their score for *impact on environment* was less. Finally, the groyne profile shows there is more sediment on the east side of the groyne. This is, therefore, evidence that the groyne is effective at preventing the transportation of sediment by longshore drift = a larger beach = provide a natural barrier between the destructive waves and the settlement. This also shows that the beach replenishment is also working to build up the beach.**

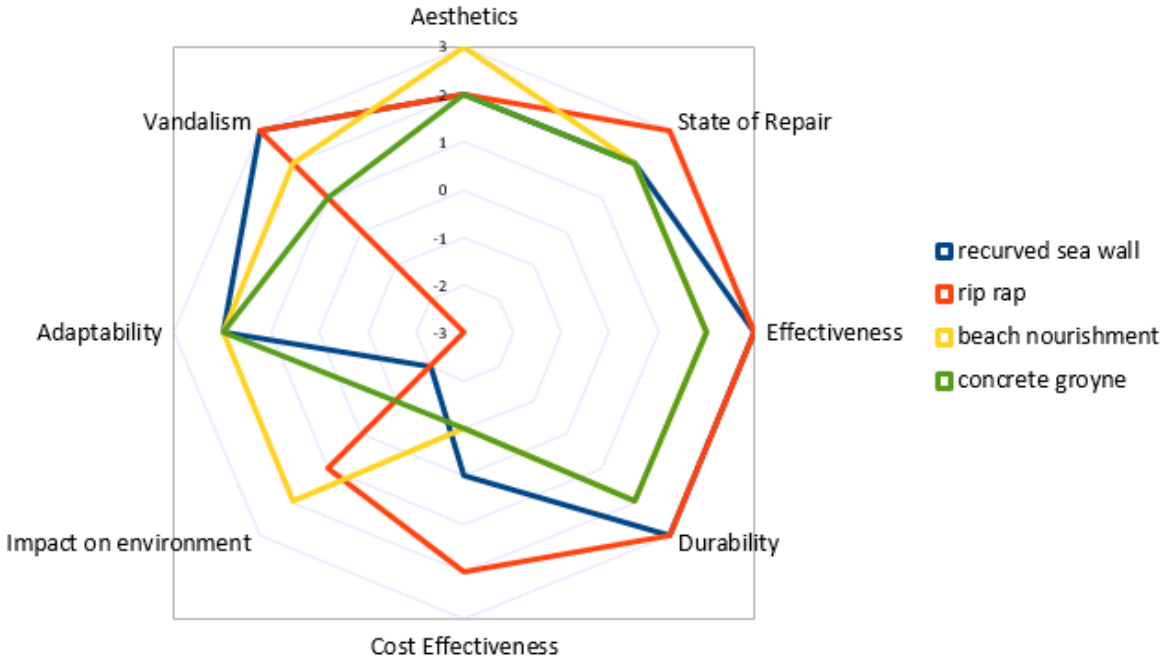
- **Chesil Beach is at risk of erosion due to the destructive waves and the soft rock . More specifically, the wave count recorded that the average wave count is 14 waves/minute evidencing they are destructive. Furthermore the geology map shows that the underlying rock type is clay (soft rock). Having said this, the field sketch shows little evidence of erosion in Chesil Beach. Sea defences protecting Chesil Beach are shown in the field sketch. These include a curved sea wall, natural rock armour, revetments and beach nourishment. The radar graph shows the sea defences overall scored highly, however not as highly as Lyme Regis due to the evidence of wire rusting on the gabions. The sea defences scored well for adaptability, effectiveness and durability due to their strong building materials. Historical data showed evidence of flooding in the town behind Chesil Beach, evidencing the sea defences are not 100% effective at protecting the coastline.**

WWW	EBI
Repeated test - *we repeated the wave count three times at each location*	Only repeated the test 3 times (at most). It would be more reliable to repeated the test 5-10 times and then took an average.
Same person collected data (*wave count, EQS)*	Human error. • *The number of waves could be miscounted.* • *Some people might pull the tape measure tighter than another person = different results. Our results would be more reliable if we made sure the same person collected the data each time.*
Checked data was similar to other groups • *I checked my wave count data with my team's data. Each measurement was only slightly different.* • *Our team checked our groyne profile data with other team data. Each measurement was only slightly different.*	Field sketches are dependent on your ability to draw. • *A field sketch of a location by one person can look very different to a field sketch of the same area drawn by another person. Instead you could take a photograph and annotate it with its key features.*
Used accurate equipment • *Accurate stop watch was used for wave count.* • *Accurate tape measure was used for groyne profile.*	Rock pools next to the groyne sometimes meant that measurements could not be taken.
Our sampling strategies were carefully chosen. • *The random sampling for our wave count prevented bias.* • *Systematic sampling (groyne profile) enabled us to collect a lot of data (every 2m up the groyne).* • *Stratified sampling (field sketch) ensured drew in a location where we could see all the sea defences (it represented the whole).*	We only recorded data on one day. Wave counts, field sketches and EQS data are affected by the weather and tides. • A location can look very different at different times of the day/year. • Waves can appear different in different weather conditions. Our data would be more reliable if we collected data multiple times across the year.
We used a wide range of primary and secondary data collection methods. Also our secondary data was up to date.	Weather can result in inaccurate results (esp. wave counts)
Our EQS used a variety of categories which allowed us to assess each sea defence in detail (*aesthetics, state of repair, effectiveness, durability, cost effectiveness, impact on environment, adaptability, vandalism).*	EQS is subjective – opinion based.

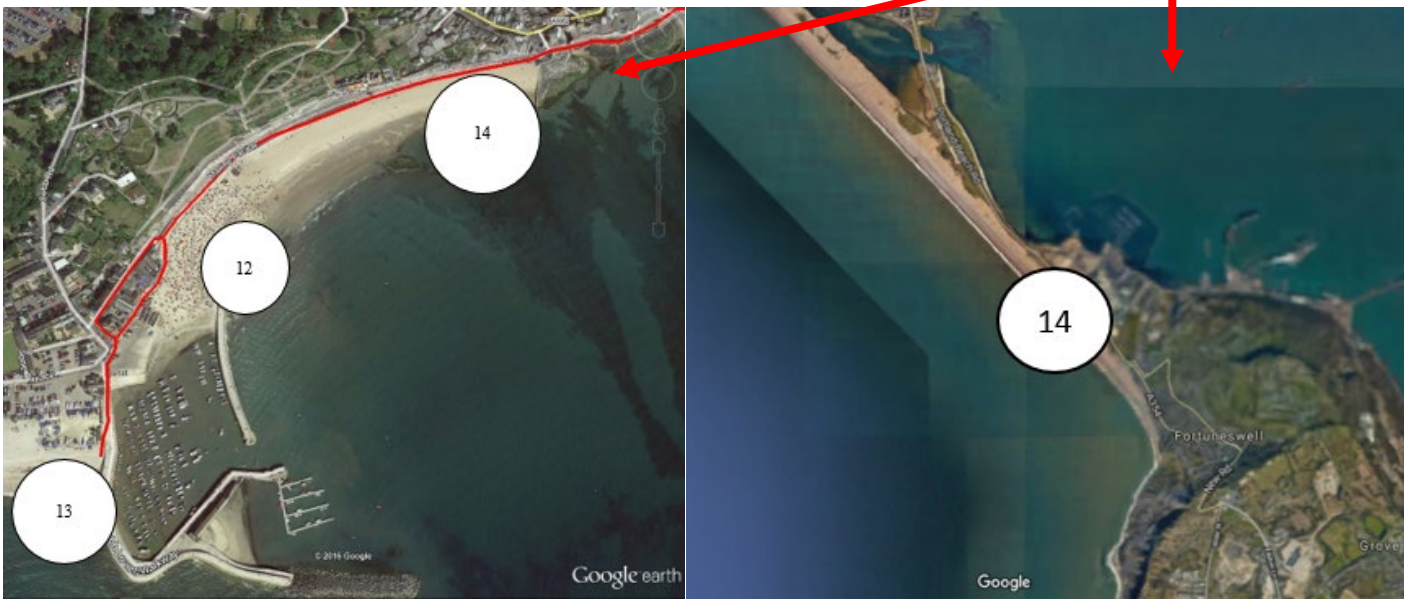
An inverted bar chart to show the data from the groyne profile test at Lyme Regis



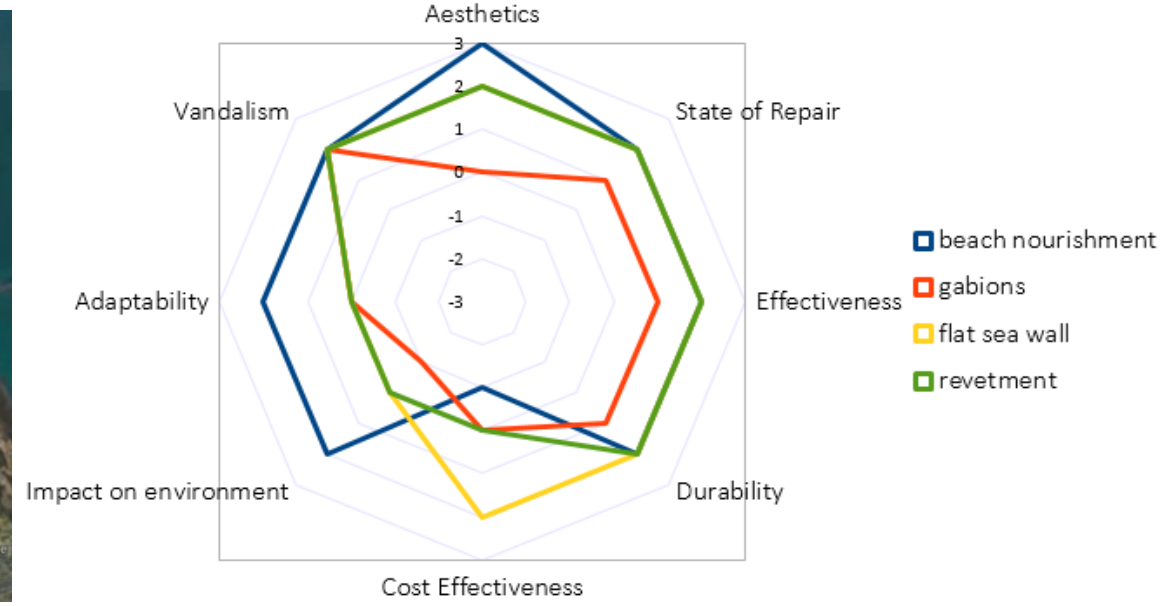
Radar Graph for the Coastal Management at Lyme Regis



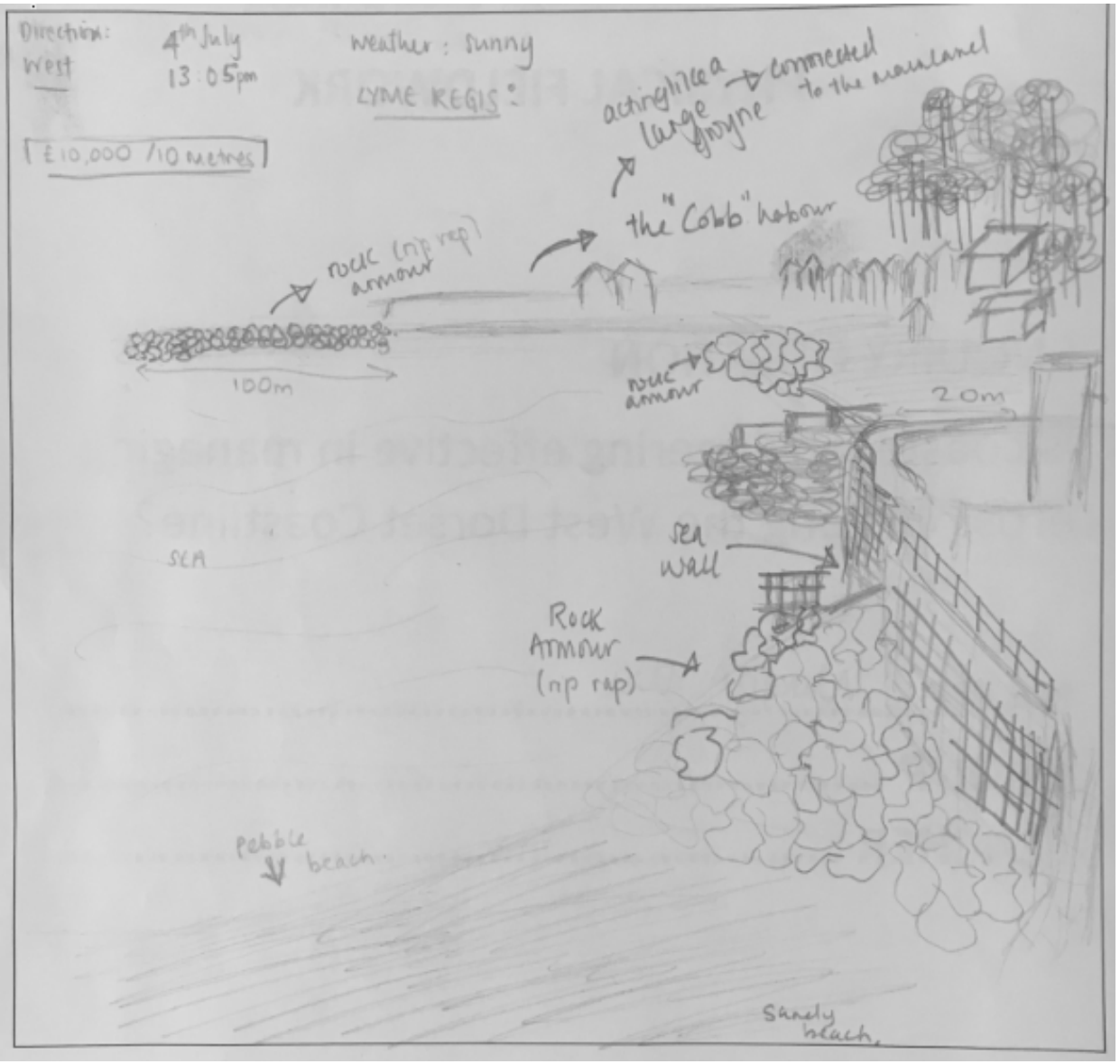
A proportional circle map showing the data from the wave count at Lyme Regis and Chesil Beach



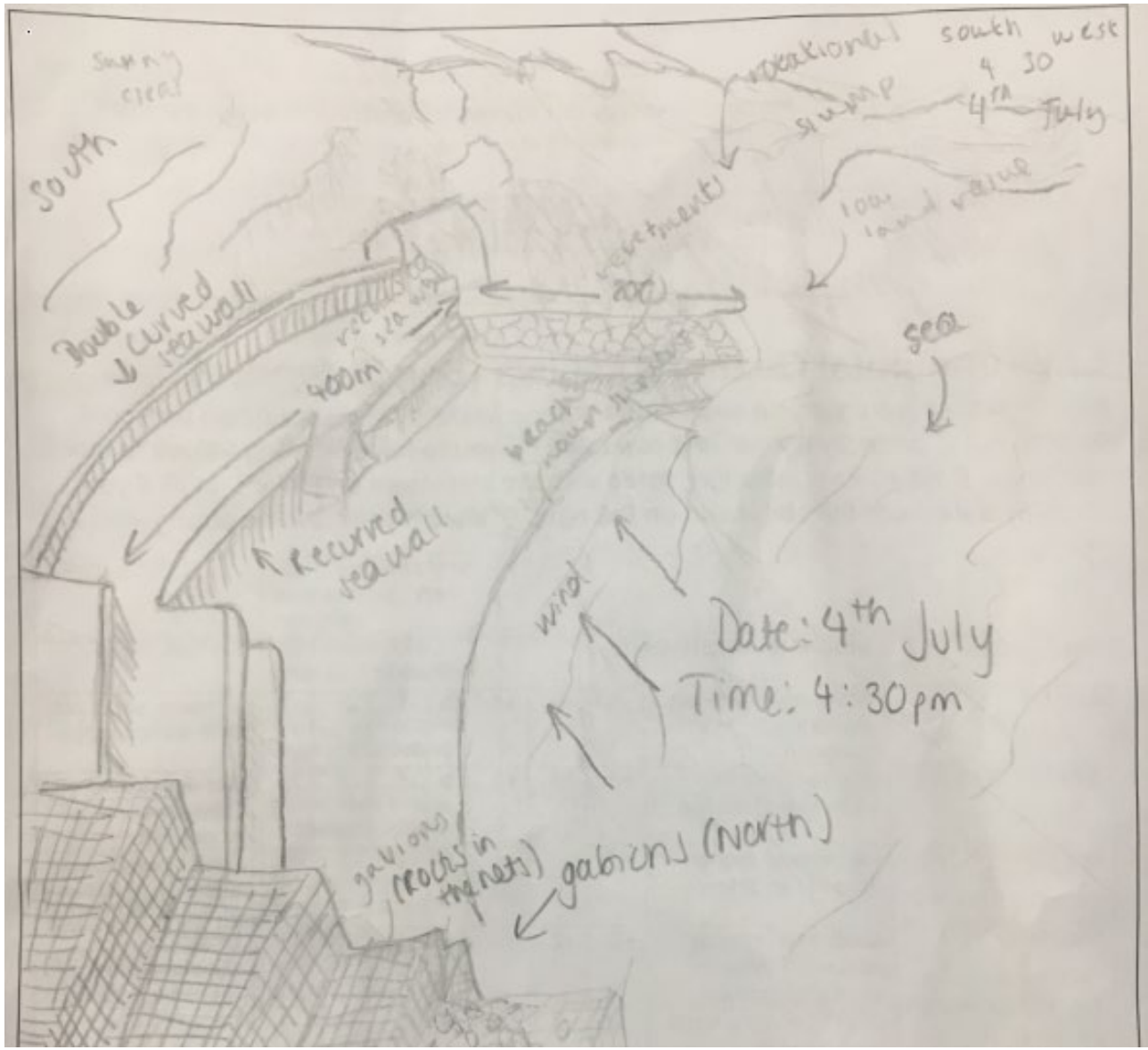
Radar Graph for the Coastal Management at Chesil Beach



Lyme Regis



Chesil Beach



HUMAN FIELDWORK: How is housing inequality evident in Brixton?

WHERE WE WENT:
We visited three locations within Brixton.

➢ *Site 1: Angell Town Estate, Site 2: Slade Gardens, Site 3: Brixton Village.*

Brixton is located in Lambeth, south London. It is one of 35 major districts that make up Greater London.

WHY WAS IT SUITABLE?

- Our study was to study housing inequality. As a result, we needed to visit an area where there is evidence of deprivation and inequality. Using census data we saw that Brixton is mostly deprived, being in the lowest decile for the income index and multiple indicator index. Census data and newspaper article also highlight the recent gentrification that has occurred meaning there are areas of higher and lower deprivation. This means it is suitable to study housing inequality.

  Urban deprivation is a standard of living that is below that of the average. Places suffering from urban deprivation have poor quality housing, poor building maintenance (leaking roofs, broken windows), abandoned buildings, pollution and fewer economic opportunities. Despite the large wealth found in parts of Brixton, many areas suffer from both urban decline and the people suffer from deprivation. It is particularly hard for the poorest people to have a decent standard of living because the prices of many things are more expensive, especially rents which account for a huge proportion of peoples incomes. Gentrification is the process where wealthier (middle class) people move into deprived areas, renovate and restore housing. This improves the general area, attracting new businesses = house prices rise. As a result many lower income residents are eventually priced out and are sometimes left with no place to go.

- There are three contrasting urban areas in Brixton, all within walking distance of each other. Each site has a different: size, type of housing and population.
- The location was suitable as it is only a 30 minute bus ride from school.
- It is a multi-ethnic community which is mainly residential.

❖ **RISK ASSESSMENT FOR THE THREE STUDY SITES**

ACTIVITY	THE RISK	HOW CAN WE REDUCE THE RISK
Walking to locations- uneven, unsteady pavements	Slips, trips and falls	• Wear appropriate footwear • Always follow footpaths, follow instructions of teachers and leaders. • Remain on the footpath.
Collecting data in a public place	Danger of interacting with strangers	• Always remain in a group • Having a designated meeting area • Always keep an adult or teacher in sight.
Walking along busy roads	Danger of traffic, crossing busy roads	• Always stay on pavement • Use designated crossings • Wait for green man to cross road

❖ DATA COLLECTION METHODS

	Justify our methodology (why I collected the data)	Why it is appropriate?	Limitations and how we can improve
PRIMARY	**Environmental Quality Survey** I completed an environmental survey at each site, to assess and compare the quality of the environment and housing to identify how it changes throughout Brixton. I judged the housing and environment using a scale (-2 to +2) on different criteria such as amount of dereliction, quality of building materials, evidence of green space and vegetation and overall feel of a residential area. This would clearly show if any housing inequality in terms of the quality of housing and environment differed throughout Brixton. *Sample size – a random location was chosen at each urban settlement. We used random sampling to avoid bias and because the area was quite large.*	**Advantages** This method makes it simple to judge the quality of an area and compare this with another area. This will help me identify the differences in several aspects of housing and the environment between the three locations in Brixton, and identify any inequalities that exists.	**Limitations** • It is subjective and can be biased as based on opinion. • Only assesses on a limited amount of criteria (housing, graffiti, litter…etc.). Certain aspects of the environment may be missed. • On different days the location might look different **Improvements** • Complete the EQS at different sites within one area to gain a better overall picture of the area. Also comparing scores between groups to reduce subjectivity and bias.
	Photographs I took two photographs of the housing at each site visited (Angell Town Estate, Brixton Village and Slade Gardens). It gave us clear and precise evidence to help me identify differences in the quality of environment and housing between the locations in Brixton *Sample – random. We randomly took 2 photographs of housing at each location, to avoid bias and capture a representation of large area.*	**Advantages** Photos give evidence to visually see the differences in quality of housing, between the 3 sites in Brixton and identify any inequality that exists.	**Limitations** • Only captures one particular moment in time, environments can change due to weather or at different times of the year. • Cannot see behind the photographer. As a result, the whole landscape and environment cannot be captured **Improvements** • Take more photographs so the 'whole environment' is covered. • Take pictures on different days and at different times to give a broader view of the environment.
	Land Value and Property Type Survey was used to measure the value of the land and type of property in a certain area. This would then allow me to identify the differences in price of housing, identifying inequalities throughout the 3 locations. It would also show me the differences in type of property, clearly differences in type clearly identify the inequalities in housing that exist in Brixton. *Sample Size – stratified. This was to generate results which are more representative of the whole population It is very flexible and applicable to many geographical enquiries.*	**Advantages** Clear and simple quantitative evidence. It allows us to effectively see the difference in land value in each location and help identify any inequalities that exist.	**Limitations** • Subject to personal opinion, because sometimes it is difficult to know exactly how many houses are in an area. • There could be two different land uses in the same block of land (e.g. flat above a shop). It can therefore be difficult to categorise as a whole. **Improvements** • When completing the land value survey we could use more categories to categorise types of building. Also using secondary data and asking residents and homeowners specific information about the size or cost of property rather than estimating.
SECONDARY	**Census Data shown on a choropleth map** Census data provides data on people and households in the UK (e.g. age, gender or employment) Mapping census data allows us to see the population's characteristics in a visual way and makes it easier to identify a settlement's characteristics. *Why use it?* We can compare different geographical locations to compare information on all aspects of the population. For example, we can compare the populations in our three locations in terms of housing, income and other socio-economic differences.	**Advantages** It is the most accurate data available on the whole population of an area. It can be used to compare a wide variety of data and characteristics of a population (e.g. income, housing)	**Limitations** • It is only ever done every 10 years, which allows for high levels of change (for example areas could be effected significantly by migration over a decade). • It takes months to collect, during which data is subject to change. • Households can give false information accidently through incorrectly filling in forms especially, or indeed give misleading information about their household. **Improvements** • Use alternative secondary data sources – *e.g. Crime data present on maps to show spatial variations and differences.*

	❖ DATA PRESENTATION	❖ ANALYSIS
RADAR GRAPHS	**Radar graphs were used to show data from the Environmental Quality Survey** ✓ Good, simple visual representation of data. ✓ They allow you to display several sets of data on one graph. ✓ Easy to compare. Alternatively a CHOROPLETH MAP could be used on a map of the area. This would allow you to see the differences in regards to their specific location, however you would not be able to display several sets of data at once.	The quality of the environment and housing in Slade Gardens was better than Brixton Village and Angel Town Estate, with Angell Town having the worst quality environment and housing. • Slade Gardens scored the highest available score (+ 2) for *housing repairs, litter, safety and greenery.* • *Angell Town* scored the lowest available score (-2) for *congestion, housing repair, greenery, litter, graffiti and safety.*
ANNOTATED PHOTOGRAPHS	**Annotated photographs** ✓ Good memory tool, especially if accompanied with detailed annotations. X Only show one view, at one point in time. Therefore may not be an accurate representation of the area Alternatively we could have used FIELD SKETCHES. These would mean we could focus on the features of the environment & housing relevant to our study	In Slade Gardens the houses are large (3+ bedrooms), new and well maintained. There is lots of greenery and gardens. In Brixton Village, while houses are quite small they are of a good quality. There is little greenery and a lack of parking, however good lighting = safer. There is lots of entertainment (bars, restaurants) In Angell Town there are mainly high rise small flats (1-2 bedrooms). The buildings are poorly maintained, with lots of graffiti and broken windows. There is very little greenery.
STACKED BAR CHART	**A stacked bar chart was used to show land value data.** ✓ Useful for comparing total values, as well as seeing the types of buildings found at each site. ✓ Simple to understand. ✓ Good visual representation of the land value at each site. Alternatively we could have used PIE CHARTS to represent our data. It would show the percentage of each type of land use as each segment.	Slade Gardens had the highest land value, with an overall value of £25.5 million. This was made up of predominately detached and semi-detached houses, which cost between £1 million to £1.5 million each. Brixton Village had the second highest land value, with an overall value of £15 million. This was made up of predominately commercial buildings (bars, restaurants, shops) and terraced houses, which cost £750,000 each. Angell Town had the lowest land value, with an overall value of £5.5 million. This was made up of predominately high and low rise flats, which cost between £150,000 and £200,000.
CHOROPLETH MAP	**Census Data was shown on a choropleth map.** ✓ Clear and visual to show data and identify differences.	Slade Gardens has less social deprivation than Angell Town and Brixton Village. Angell Town is in the 10% most deprived areas for social deprivation and housing deprivation within the UK.

❖ CONCLUSIONS

Our results show there is a housing inequality within Brixton, with the quality of housing and environment differing significantly between Slade Gardens, Brixton Village and Angel Town Estate.

- **This is supported by the stacked bar chart, which shows the land value data. Overall Slade Gardens has greater number of high value properties than the other two locations, especially compared to Angel Town which has the highest number of low-value properties. Slade Gardens' land value was estimated at £25.5 million, mainly made up of detached and semi-detached housing, whereas Angel Town's land value was estimated at £5.5 million, made up mainly of high rise and low rise flats. This was obviously shown in our annotated photographs which showed Slade Gardens had many large houses (4+ bedrooms) which averaged between £1 - £1.5 million, whereas Angell Town mainly having small flats (1-2 bedrooms) averaging between £150,000 and £200,000 each.**
- **Environmental quality survey data and annotated photographs, show that the environment in each location is very different, with Slade Gardens scoring very highly. At this location there was little graffiti, lots of greenery and a safe environment. The overall score at Slade Gardens was 17, with 7 out of the 12 scores achieving the highest mark of +2. Brixton Village scored highly with well maintained buildings. Angel Town had the lowest quality environment, with houses kept and maintained to a lower standard, cramped together with evidence of significant disrepair and some dereliction. The overall score at Angel Town was -3, with 5 of the 12 scores achieving the lowest mark of -2.**
- **Our secondary census data supports, with Angel Town being recorded within the 10% of the most deprived areas in the UK. On the other hand, census data shows that some parts of Slade Gardens are recorded as being in the 50% of the most deprived areas and therefore is far less deprived than Angel Estate and Brixton Village. Clearly identifying there is evidence of housing inequality in Brixton.**

WWW	EBI
The three locations we visited were well chosen allowing us to collect data in contrasting locations across Brixton.	Only repeated the EQS 3 times. As a result many houses at each location were not recorded. If I completed 5 EQS tests and then averaged my scores, it would be more reliable.
The data between groups in our class had only slightly different results/judgements, even though different groups collected their data at slightly different times.	I only took one standard photograph. This means many of the houses were missed in the photograph. I could improve this by taking a panoramic photograph at places within each location.
There were few anomalies in the data. *I checked this by comparing my data to the rest of my group.*	EQS is subjective – opinion based.
We used a good range of primary and secondary data collection methods (3x primary and 2x secondary – *census data/newspap*ers)	We only recorded data on one day. An urban area can look very different at different times of the day/year. Our data would be more reliable if we collected data multiple times across the year and at different times of the day.
Our secondary data was up to date (based on the most recent census data in 2011)	Human error. Someone could have missed a house or miscounted the amount of properties in their land value survey.
We did our EQS three times, which meant we could calculate an average across all 3 sites.	Our land value survey only had 6 categories and the only category for a non residential building was other. This made it difficult to assign the correct category for each building as other was used for shop, restaurant, bar, café…etc. They do not all have the same land value. To improve this we could use more categories.
Our EQS used a variety of categories which allowed us to assess environmental inequality in detail (*aesthetics, congestion, air quality, litter, graffiti)*	Our land value survey was based on estimates and average house prices. It would be more reliable if we used secondary data (zoopla) to determine the actual cost of each house/building we counted.

Annotated Photographs

ANGEL TOWN

High-rise flats. In each flat, there is very little floor space and only 1-2 bedrooms. Tends to be lower price and poor quality.

Very little greenery and vegetation. Not an attractive and friendly environment.

1970's build. Poor quality and of low maintenance. Not an attractive building to look at.

SLADE GARDENS

Lots of vegetation and greenery and lots of gardens. This adds value to the area and makes it look more appealing.

Pre-1950s housing. Town houses with 3-6 bedrooms and large floor plans. This means that the value of properties are high.

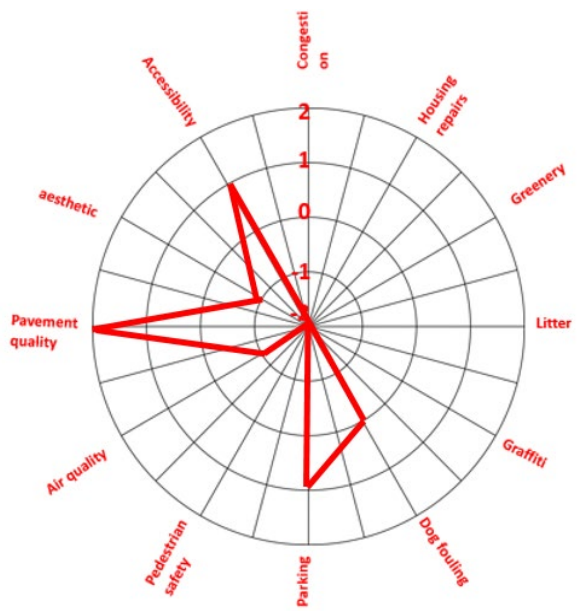
BRIXTON VILLAGE

Very little vegetation or greenery. The area is clean with only small evidence of litter and graffiti.

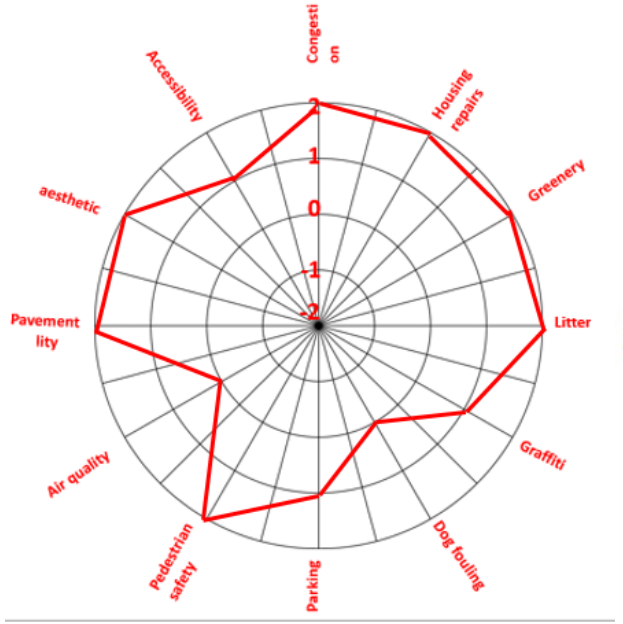
Terraced housing, with off street housing. Approximately 2-4 bedroom houses with medium sized floor plans.

Radar Graphs

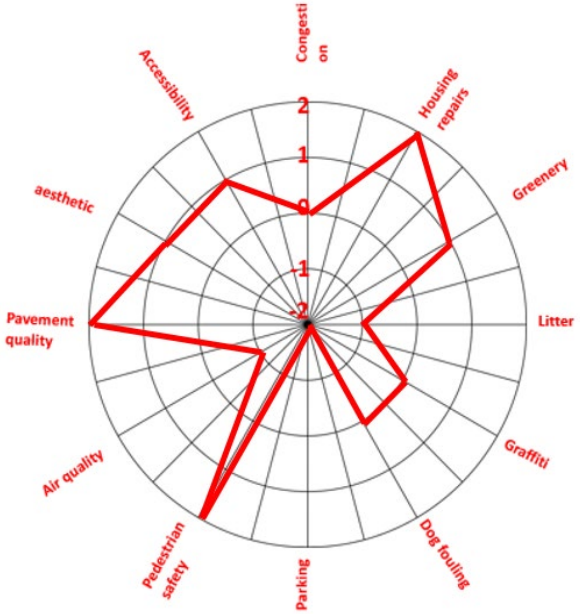
Angel Town



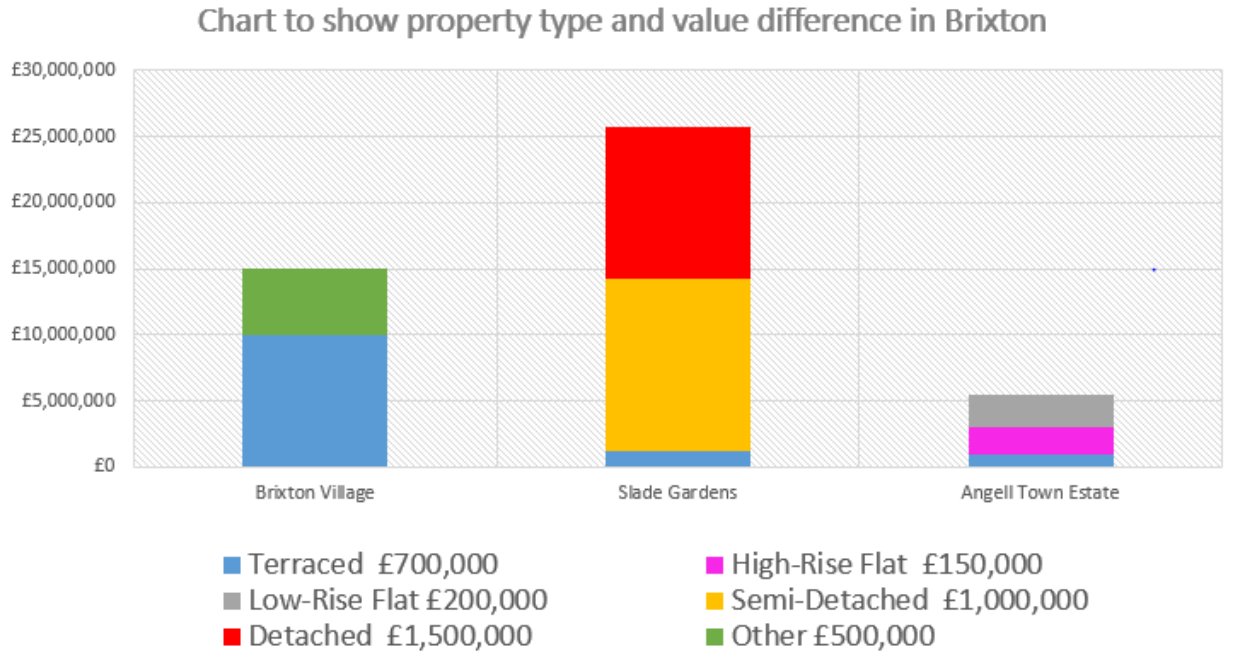
Slade Gardens



Brixton Village



Stacked Bar Chart



Choropleth Map showing Census Data

Map to show the distribution of Deprivation within South London