

Topic 6A: Geographical Investigations – fieldwork

Investigating coastal landscapes

Enquiry question

When completing a geographical study, it is important to have an aim. We can do this by asking a task question, with a series of key questions to break the question down.

Our task question:

- What impacts do different methods of coastal management have on coastal processes and communities at Swanage?

Key questions:

- What are the problems facing the coastline of Walton on the Naze?
- What types of coastal management techniques are used?
- What impacts have these techniques made on coastal processes?
- What impacts have these techniques made on communities?

Locating the study

Our study took place in Walton on the Naze, on the South East coast of England. From the capital city London, it will take about 1:30 hours depending how much traffic there is and what route you take. Walton on the Naze is in the county of Essex.



National scale

Justification for location

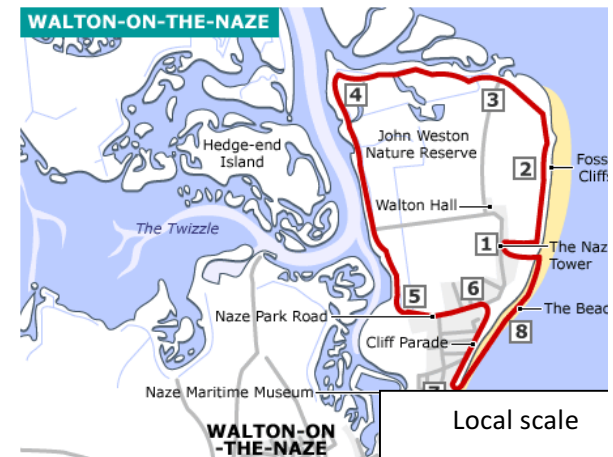
At Walton on the Naze, we chose 3 sites along the beach. The sites were chosen at regular intervals along the beach – approximately every 5 groynes apart. Each one was measured 5metres to the west of the groyne. The measurement was done at the top of the beach to ensure that no one was in the water. This gave a representative sample along the beach and a good opportunity to collect the samples before high tide.



Regional scale

Different ways of collecting data

- Primary data – data you collected yourself/ first hand
- Secondary data – data that has been published
- Quantitative data – data in numbers
- Qualitative data – data that describes
- Random sampling – data is collected by chance
- Systematic sampling – data is collected at equal intervals from each other
- Stratified sampling – data is collected from two significantly different areas
- Continuous data – all points on a number line have meaning
- Discrete data – whereby units of measurement cannot be split up



Local scale

Methodology – what we did, how we did it & why

Primary data

Method	Outline of method	Purpose of method
Sketch of Walton on the Naze	We will go to the cliff and draw a sketch of Walton on the Naze and label the key features	This experiment will be important because we will be able to see the rock types at Walton is made up of and will be able to judge whether one has been more eroded than another. In addition we can see if there is a beach in the area and any erosion present on the rocks.
Sediment roundness and size	at each site, we placed the quadrant down & randomly selected 10 pieces of sediment. Using a ruler, we measured the longest axis. Then we compared the shape of the sediment using the Powers scale of roundness	we measured sediment size & shape at 3 different locations so we could see if there was a difference between them. We also used random sampling to allow an equal chance each size of sediment would be selected.
Beach profile	At each site, we placed the ranging poles at the bottom of the beach & measured the angle between the two ranging poles. Whenever there was a change in angle of the beach, we placed a ranging pole & took a new measurement. This is stratified sampling.	we measured beach profile at 3 different locations so we could see if there was a difference in slope between them. We used stratified sampling so that we could see clearly the changes in the angle of the beach
Height either side of groyne	At each site, we measured the height from the top of the groyne down to the sand, on both the west & east sides of the groyne using a tape measure.	we measured height either side of the groyne at the three different locations to see how long shore drift affected the slope of the beach. We systematically measured each groyne 2 metres from the sea wall
Questionnaires	At each site, we asked people a few questions about the effectiveness of coastal processes	We asked people questionnaires to see how they were affected by the processes of erosion & longshore drift

Secondary data

Method	Outline of method	Purpose of method
Geology map	We went online to BGS online Geology of Britain & searched for Swanage	We looked at geology to see whether or not it made sense for certain areas of Walton on the Naze to be protected according to the roc/ sediment type.
Google maps	We looked online at Walton on the Naze to determine the location and find out the exact measurements	We measured this to know the location of the three sites and the sites which have the least effective coastal protection methods and the sites with more efficient methods

Risk assessment

This shows that you have thought of each problem & how you will manage it.

Name of Risk	Severity rating	How I will resolve the risk?
Travel Sickness - Travelling for long periods of coach could cause me to become ill and I could be sick	4/10	I will make sure I take travel sickness pills and drink lots of water to ensure I don't get too hot and dizzy.
Working near open water - Working near open water could be dangerous because if I slip I could fall into it and die or be injured	7/10	I will make sure to walk away from the edge of the water and walk carefully
Stranger danger - This could be a problem because when I am doing the questionnaire some people could be dangerous and hurt me	5/10	I will make sure to stay near a member of staff and have a partner with me all the time
The effects of the sun - I could get sunburnt from the sun and it can cause serious burns	3/10	I will carry sunscreen with me to ensure I am protected from the sun's dangerous rays
Effects of cold weather - I could get a cold from the cold and it could cause coughs and hurting bones	3/10	I will wear a coat and thick clothing to protect me from the cold if the weather is bad

Data presentation

In geography you use a range of geographical techniques to present your findings. You should use a mixture of simple & sophisticated techniques. A sophisticated technique is one that compares two variables to represent data e.g. a scatter graph

- Annotated photographs/ field sketches – to show coastal management techniques & the impact on local people
- Line graphs to represent continuous data e.g./ beach profile
- Bar graphs to represent group values e.g. number of people questioned
- Pie charts to represent group values e.g. show frequency of sediment
- GIS maps to present spatial data e.g. where coastal defences are

Field sketches

- + good memory tool, especially when accompanied by annotations
- Only shows one view at one point in time
- May not be an accurate representation

Scatter graphs

- + shows correlation between 2 data sets
- + shows data spread clearly & any anomalies
- Too little data can produce skewed results
- Cannot show relationship between more than two variables

Pie charts

- + shows % of each segment
- + represent wide range of statistical data & contribution of each segment is clear
- No exact numerical data
- Calculation of amounts is more difficult than bar charts

Geology map

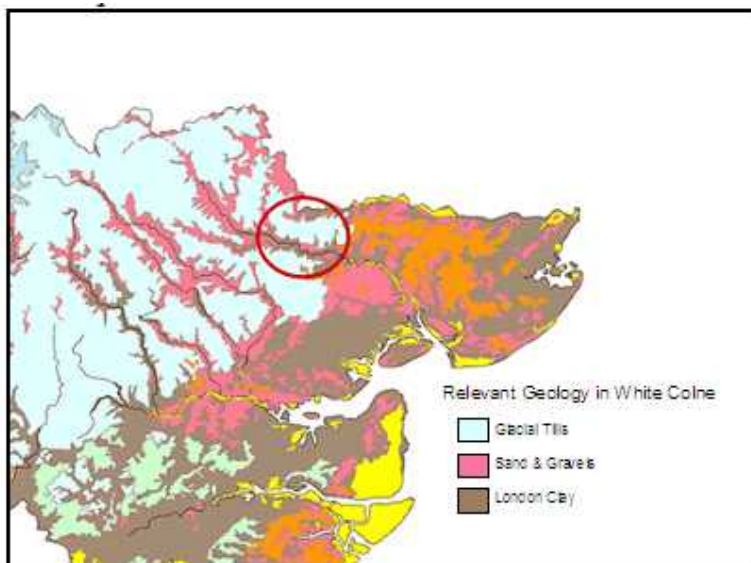
Shows the different types of rock in Walton on the Naze.

Bar graphs

- + good visual representation of data
- + simple to construct/ easy to understand
- Graph categories can be reordered to emphasise certain effects
- Can only use with discrete data

Dispersion graphs

- + visually effective as full range of data can be seen
- + useful to make comparisons between data
- Can only use with continuous data



Compound bar graph

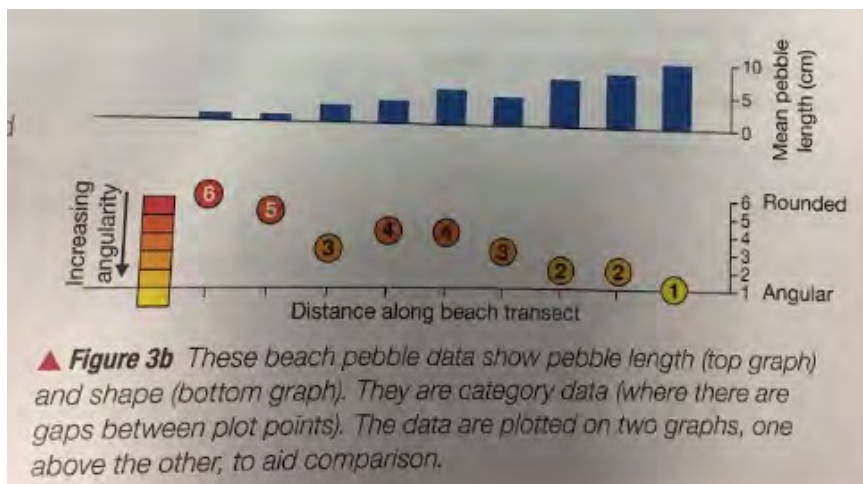
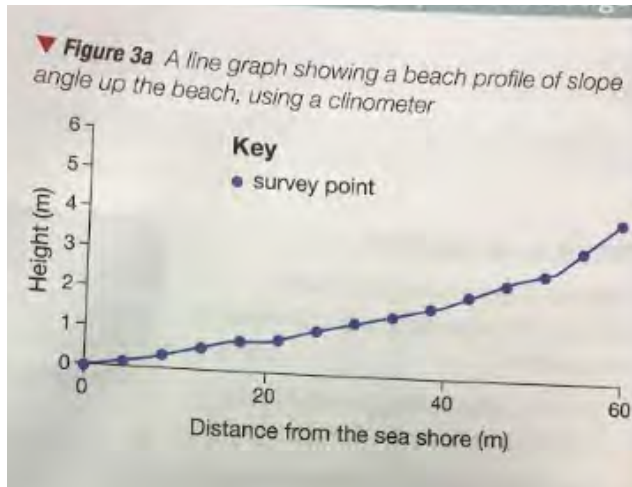
- + visually strong
- + can fit as many subtotals onto one bar
- Takes time to work out individual pieces & the number of the total

Statistical tests

Median – middle number of the data set
Mode – number that occurs the most
Mean – average of the data set
Interquartile range (IQR) - measure of the spread of values around the median. The greater the spread, the higher the IQR

Calculating the IQR

1. Rank the numbers from lowest to highest
2. For the UQ, take the 25% highest values & find the mid- point between the lowest of these values & the next highest value
3. For the LQ, take the 25% lowest values & find the mid- point between the highest of these values & the next highest value
4. Calculate UQ – LQ to get IQR



Analysis

You now need to write up your findings to explain what all this data shows you about how coastal management affects coastal processes & communities at Swanage. You will need to analyse both primary & secondary data.

To analyse you need to:

- Identify patterns & trends in your results & describe them
- Make links between different sets of data e.g. how sediment size & roundness change at the same time
- Identify anomalies – unusual data that does not fit the pattern
- Explain reasons for patterns you are sure about e.g. data that shows longshore drift is occurring along the coast
- Suggest possible reasons for patterns you are unsure about – why do results suddenly change

Tips for writing an analysis

- Use correct geographical terminology
- Use the past tense
- Write in the third person (avoid using words like I or we)

Analysing quantitative techniques

- Quantitative techniques involve looking at numerical data that can be analysed by looking at the statistical techniques e.g. mean, median, mode, range & quartiles

Conclusion

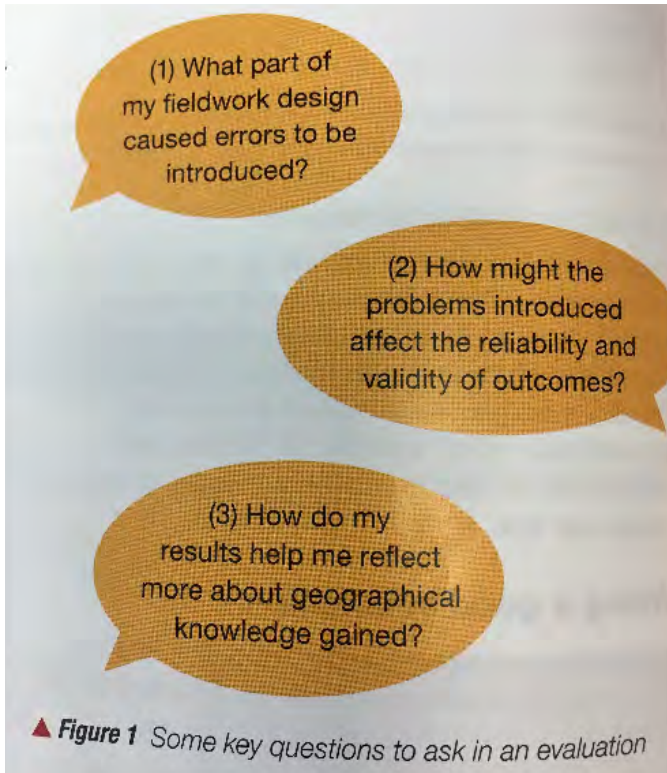
- Write a final conclusion that ultimately gives an answer to the big title question. Your conclusion should therefore:
- Refer to the main aim of your investigation. What did you find out?
- State the most important data to support your conclusion.
- Comment on any anomalies and/or unexpected results.
- Comment on the wider geographical significance of your study e.g. why is this important? Could your results be useful to others? Do you think all coastal areas are like this?

Analysing qualitative techniques

- Qualitative techniques involve looking at photos & sketches that provide vital clues & evidence about what the fieldwork was like
- Annotations of photographs or field sketches can show how processes change over time

Cause and effect	Emphasis	Explaining	Suggesting
as a result of...	above all...	this shows...	could be caused by...
this results in...	mainly...	because...	this looks like...
triggering this...	mostly...	similarly...	points towards...
consequently...	most significantly...	therefore...	tentatively...
the effect of this is...	usually...	as a result of...	the evidence shows...

▲ **Figure 1** The language of analysis – these words and short phrases are useful to use in analysis



Evaluation

Here you need to reflect on your investigation. You need to answer these questions:

- What went well in your investigation? Why?
- What didn't go so well? Why?
- How might any problems have affected the results?
- What could you do to improve if you did this again/ had more time?
- How do your results help you understand the key question?

Things that could have gone well/ badly:

- Sample size – smaller sample size usually means lower quality data. Why?
- Frequency of sample (e.g every 10 meters instead of every 100 meters) – fewer sites reduces overall quality of data
- Type of sampling – may create “gaps” and introduce bias in the results. Can you think of an example?
- Equipment used – The wrong/inaccurate equipment can affect overall quality by producing incorrect results.
- Time of survey – different tides may influence beach accessibility and its measurable width
- Location of survey – big variations in beach profiles and sediment characteristics can occur in locations close to each other
- Quality of secondary data – age and reliability of secondary data can affect overall quality

Problems affecting the results:

- Time of investigation – during school day so less teenagers/ employed people around to ask
- Location of survey – big variations in beach profiles and sediment characteristics can occur in locations close to each other
- Weather – rain/ cold weather would put people visiting Swanage so less people to ask & difficult to complete booklet