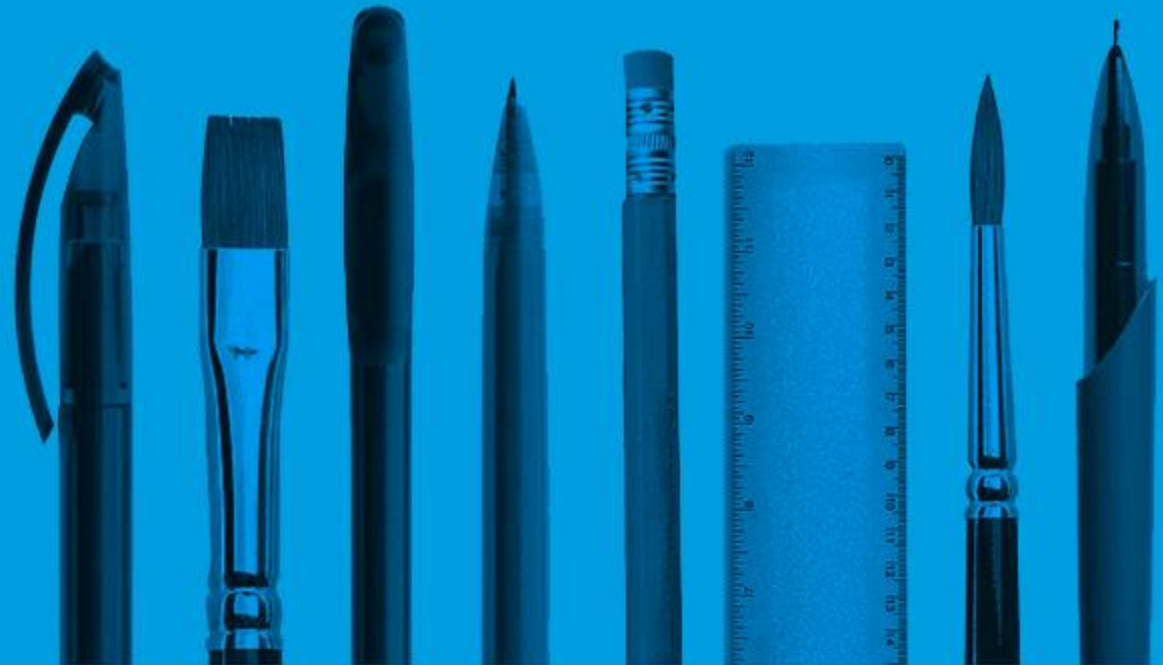


Data and statistical skills for AS & A level

Bob Digby

Spring 2017



Topics covered

- Coastal / Glaciated landscapes – familiar territory
- Changing Places – new territory
- Balancing a mixture of quantitative and qualitative data
- These are likely to be the foundations for the Independent Investigation

Summary of WJEC Wales Geography AS

Data skills

Assessed in
Units 1 and 2 as
data response /
skills-based
questions

Fieldwork Not
submitted but
examined in
Component 2
exam paper

AS Unit 1: Changing Landscapes

Written examination: 2 hours

24% of qualification

96 marks

Section A: Changing Landscapes

Choice between two themes, **either** Coastal **or** Glaciated Landscapes; two compulsory structured questions with data response

Section B: Tectonic Hazards

Three compulsory structured questions with data response

AS Unit 2: Changing Places

Written examination: 1 hour 30 minutes

16% of qualification

64 marks

Section A: Changing Places

Two compulsory structured questions with data response

Section B: Fieldwork Investigation in Physical and Human Geography

Three compulsory structured questions with data response on fieldwork and the learner's own fieldwork investigation

Summary of WJEC Wales A2 – Unit 3

Data skills

Assessed in
Unit 3 as
data
response /
skills-based
questions,
including a
synoptic
question in
Section C

A2 Unit 3: Global Systems and Global Governance

Written examination: 2 hours

24% of qualification

96 marks

Section A: Global Systems

Water and Carbon Cycles: two compulsory structured questions with data response and one extended response question

Section B: Global Governance: Change and Challenges

Processes and patterns of global migration and global governance of the Earth's oceans: two compulsory structured questions with data response and one extended response question

Section C: 21st Century Challenges

One compulsory extended response question drawing on Units 1, 2 and 3 with resource material

Summary of WJEC Wales A2 – Units 4 and 5

A2 Unit 4: Contemporary Themes in Geography

Written examination: 2 hours

16% of qualification

64 marks

Section A: Tectonic Hazards

One compulsory extended response question

Section B: Contemporary Themes in Geography

Select two optional themes from four:

- Ecosystems
- Economic Growth and Challenge: India or China or Development in Sub-Saharan Africa
- Energy Challenges and Dilemmas
- Weather and Climate

Two essay questions, one on each chosen theme

A2 Unit 5: Independent Investigation

Non-exam assessment: 3000 – 4000 words

20% of qualification

80 marks

One written independent investigation, based on the collection of both primary data and secondary information

Data skills
Assessed in
Unit 5
throughout –
the big ‘hit’ on
skills

Changing Landscapes AS - possibilities

- GIS mapping of a variety of coastal landscapes in a region or between regions
- Calculating and comparing rates of cliff recession along a variety of coastlines
- Classifying waves (into destructive and constructive) using measures of central tendency.
- Using student t-test to investigate changes in pebble size and shape along a drift-aligned beach.
- Vegetation surveys in sand dunes or salt marsh plant communities to assess the nature of plant succession using Chi-square

Coastal landscapes – rates of cliff recession





Coastal landscapes – rates of cliff recession

Coastal landscapes – rates of cliff recession

On the other side of the headland



Coastal landscapes – quantitative data

A 17 January midnight – noon	Waves per minute
00:00	9.1
00:30	9.0
01:00	8.7
01:30	8.6
02:00	8.8
02:30	8.2
03:00	8.2
03:30	8.6
04:00	8.5
04:30	8.8
05:00	8.8
05:30	9.2
06:00	9.7
06:30	9.5
07:00	9.5
07:30	9.8
08:00	10.0
08:30	10.2
09:00	10.2
09:30	10.5
10:00	10.9
10:30	10.5
11:00	10.3
11:30	10.0
12:00	10.0

B 17 Jan 13.30 pm – 18 Jan 01.30 am	Waves per minute
13:30	14.0
14:00	14.3
14:30	14.3
15:00	15.4
15:30	16.2
16:00	16.2
16:30	15.8
17:00	15.8
17:30	16.2
18:00	15.8
18:30	16.2
19:00	15.8
19:30	15.0
20:00	15.0
20:30	15.0
21:00	14.6
21:30	14.0
22:00	14.6
22:30	14.0
23:00	15.0
23:30	14.6
00:00	15.0
00:30	15.8
01:00	15.0
01:30	15.8

- Using the data, create a **dispersion diagram** for wave frequency for **each** of Columns A and B, and then calculate the range for each set of data.
- Calculate the **mean, median and mode** for wave frequency in each of Columns A and B.
- Using the dispersion diagrams, calculate the **quartiles** for each set of data.
- Compare the wave data for each period.
- Explain the **likely impact of the waves** in each period on Hornsea's beaches during 17-18 January 2016.

Changing Places AS – new content

Study must develop the required knowledge and understanding:

- by **starting** study from the local place within which students live or study and **at least one further contrasting place** through which to develop the required knowledge and understanding.
- Study must involve **moving out** from the local place to encompass regional, national, international and global scales in order to understand the dynamics of place.
- Note that a local place may be a locality, neighbourhood or small community, either urban or rural.

Changing Places

1. Changing place; changing places – relationships and connections
2. Changing place; changing places – meaning and representation
3. Changes over time in the economic characteristics of places
4. Economic change and social inequalities in de-industrialised urban places
5. The service economy (tertiary) and its social and economic impacts
6. The 21st Century knowledge economy (quaternary) and its social and economic impacts
7. The rebranding process and players in rural places
8. Rural management and the challenges of continuity and change
9. The rebranding process and players in urban places
10. Urban management and the challenges of continuity and change

Changing Places – how and why places change





Changing Places – how and why places change

Changing Places – how and why places change





Changing Places – how and why places change

Changing Places – how and why places change

Changing from this



Changing Places – how and why places change



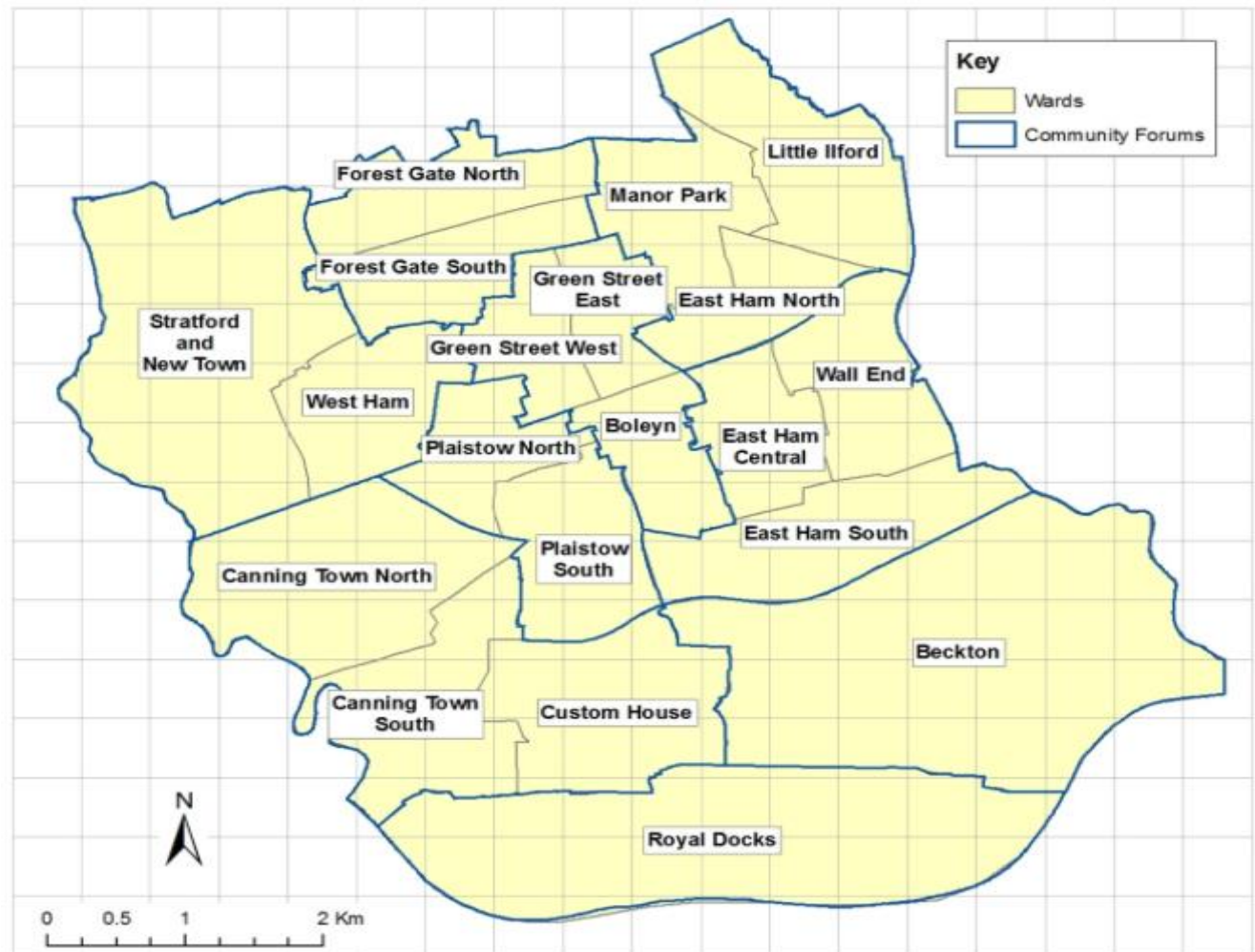
Changing Places – how and why places change

..... into this



Changing Places – deprivation data from 2015

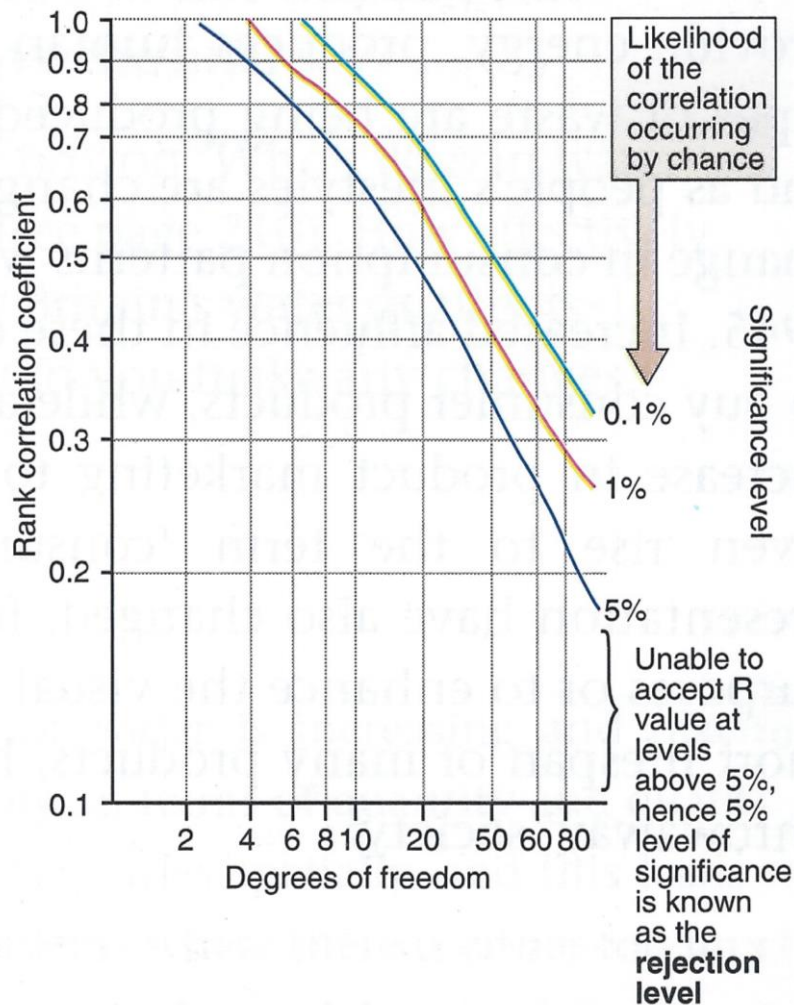
Changing Places – deprivation data from 2015



Changing Places – exploring deprivation in Newham

Ward in Newham	% Households living in social housing (2011)	% Adults claiming out of work benefit (2011)	Median Household income est. (2012/13)
Beckton	36.5	17.4	34,100
Boleyn	25.8	17.5	31,630
Canning Town North	49.3	25.8	28,910
Canning Town South	36.0	23.2	32,870
Custom House	41.4	22.9	31,840
East Ham Central	15.7	15.8	32,380
East Ham North	17.6	17.1	32,340
East Ham South	31.1	19.4	31,430
Forest Gate North	28.9	16.1	34,270
Forest Gate South	26.4	17.7	34,550
Green Street East	12.8	14.2	31,570
Green Street West	13.5	14.7	31,080
Little Ilford	30.1	20.6	29,730
Manor Park	22.5	18.0	31,580
Plaistow North	41.7	19.3	30,740
Plaistow South	25.1	19.9	31,750
Royal Docks	30.8	18.4	38,580
Stratford and New Town	31.8	17.8	35,840
Wall End	17.7	14.7	32,330
West Ham	40.9	18.5	32,310

Testing for significance



- For greater precision, any correlation coefficient should be tested for significance.
- Significance is a mathematical term, which allows the user to get a measure of confidence in the correlation they have calculated.
- E.g. a correlation of + or - 0.5 does not suggest a definite link between sets of data, and the result could be due to random chance.
- To test whether this is likely, use a **significance table**.

The process of significance testing!

- Note how many paired data items have been used in the correlation.
- This is labelled as 'degrees of freedom'.
- Degrees of freedom are a statistical convention, arrived at by subtracting 1 from the number of paired items being correlated. (For example, in the deprivation data, there are 20 wards in Newham, so $20-1 = 19$ degrees of freedom.)
- Find this number on the horizontal scale in Figure 5.
- Now find the correlation coefficient (ignoring the + or -) on the vertical scale in the significance table. Find where the two points meet.
- If the point occurs above the **5%** line, there is a low probability (under 5%) that the correlation was caused by chance. If it occurs above the **1%** line, the likelihood of chance is even less, and less still if it occurs above the **0.1%** line!

The significance of significance!

- Significance tables allow a correlation to be expressed as a percentage level of **confidence limits** (or **intervals**), usually 95% or 99%.
- This means that 95 or 99 times out of 100, the relationship is unlikely to have been caused by chance – and is therefore significant.
- The greater the 'n' value, the lower the likelihood will be that any correlation was caused by chance.
- However, this is purely a statistical relationship and does not imply any cause! Other evidence is needed to explore causality.

Collecting data: quantitative vs qualitative

- Consider balancing ‘hard’ (quantitative) versus ‘soft’ (qualitative) data

Qualitative methods include:

- interviews (structured, semi-structured, open-ended / ethnographic) – which can be face-to-face, by phone, text messaging or online e.g. Skype / Facetime
- Interpretations of images (photos, advertising material, paintings), paintings, music, film, text and other media e.g. in place identity and representation – by oneself or by others.

Analysing qualitative data 1

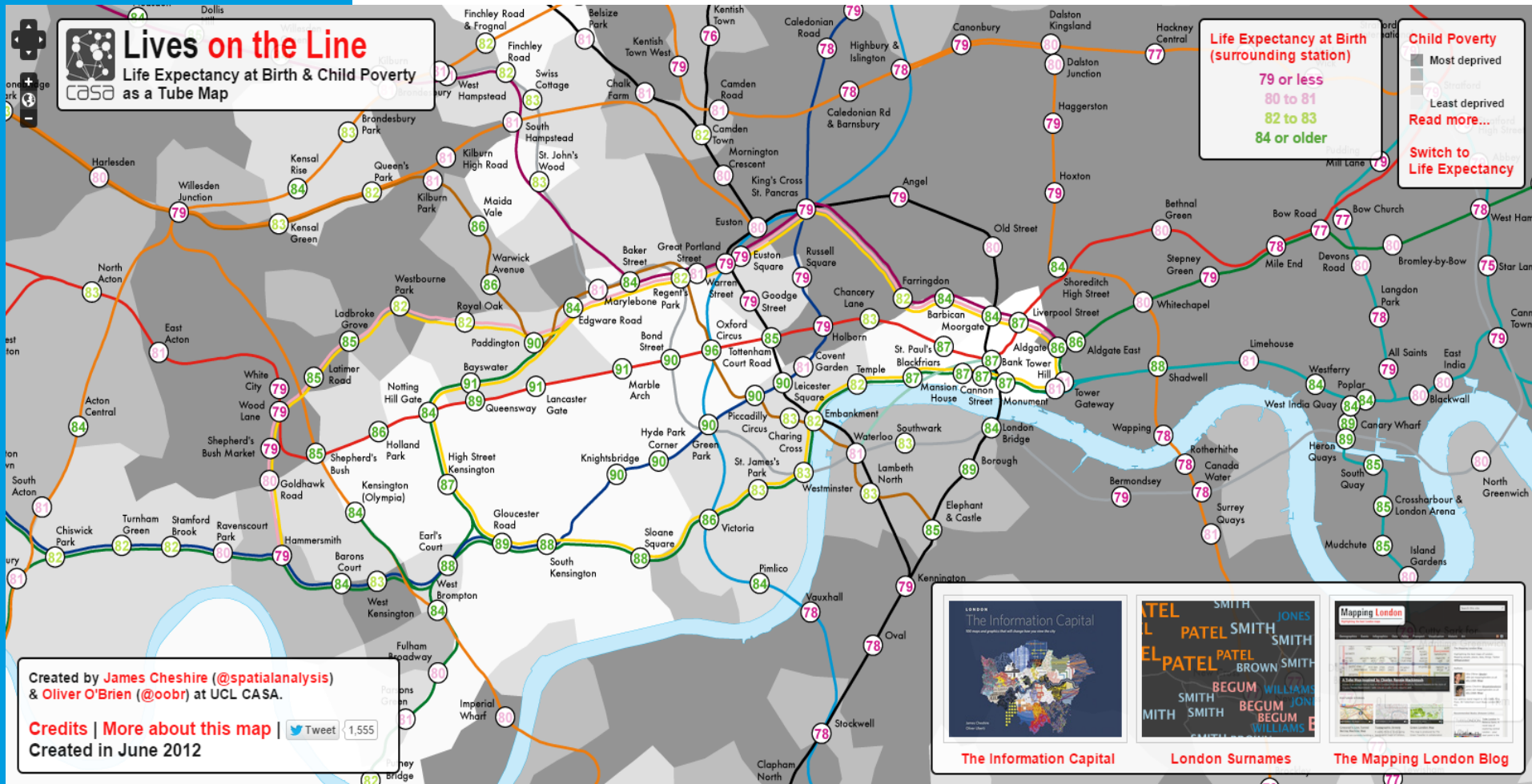
Interviews

- First, interviews should be transcribed
- Text analysis using coding* – a means of categorising text prior to further analysis (e.g. by viewpoint – pro or anti), and placing it on a spectrum (e.g. regeneration as a good or bad process)
- * *Coding is the process of assigning a code to elements of text for classification or identification*

Analysing photos, films, and paintings

- First, the technical detail should be outlined – where, direction facing, time of day, time of year, weather
- The scene should be described – objectively, i.e. what is there, a description of the subject matter
- The photo should be analysed for emotive content – how do different people react to this photo, and why?
- Analyse the findings – how do people react to the photo? How and why was this image chosen – what is it trying to depict?
- *There is excellent guidance on photo analysis (which could equally be used for painting or film) at www.getty.edu/education/teachers/classroom_resources/curricula/exploring_photographs/background.html*

Analysing secondary data



“Big data” may become a starting point

Changing Places

Ideas for teaching (or developing Independent Investigations with students) about ***relationships, connections, meaning, representation***

- **Do I see this place as you do?** Different views about the same place: blog (compare and contrast)
- **My high street mood board.** Compare and contrast with others in the group. What differences and why?
- **Which best represents?** Selection of photos from different parts of home community – Ask people to select which best represents the place – explain views
- **Interviews** – select different age groups, gender socio-economic groups etc. What patterns emerge?
- **Use blogs and messageboards** to interrogate views on local places eg:
<http://www.ilivehere.co.uk/> other useful sites include Trip Advisor or MumsNet

Using qualitative data in studying Changing Places

Students should develop the following with respect to **qualitative data**:

- use and understanding of a mixture of methodological approaches, including interviews
- interpretation and evaluation of a range of source material including **textual** and **visual** sources
- understanding of the opportunities and **limitations** of qualitative techniques such as **coding** and
- sampling, and appreciation of how they actively **create** particular geographical **representations**
- understanding of the **ethical** and socio-political implications of collecting, studying and representing geographical data about human communities.

If you have questions...

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