Elective Geography
Fieldwork (Section A)

Scheme of assessment:

Section A (13%)

- 2 structured questions on Geographical Investigations based on following topics:
  - Global Tourism
  - Variable Weather and Changing Climate
- 1 question set on each topic. Candidates must answer one question in this section.

Geographical Investigation (GI)

(a) formulate aims and hypotheses/guiding questions
(b) inquiry skills and techniques to collect data
(c) make analyses of data
(d) presentation techniques to display data
(e) form conclusions

Formulating aims and hypotheses/guiding questions

Note:

- Identify **independent variable** + **dependent variable**

Hypothesis: a statement

The further the distance from the shoreline [***independent variable***],
the smaller the size of beach sediments [***dependent variable***].

Guiding question: a question

How does the distance from the shoreline [***independent variable***] affect
the size of beach sediments [***dependent variable***]?

Data collection

Data collection

Skills	Description
1. **Observation**	● Observe physical features & human activities ● Record observations on: ○ field sketches ○ annotated photographs ○ recording sheets ○ maps
2. **Measurement**	● Measuring equipment (weather and climate) ● **Sampling** ● Location & time ● **Recording sheet**
3. **Survey using questionnaire**	● Set of prearranged questions which seeks information from people about themselves and their views ● Pilot survey ● Location & time
4. **Interviews**	● Collect in-depth information from specific group of people ● Longer duration

Recording sheet

Date: _____
Time: _____
Hypothesis: _____

Name of tourist attraction:			
Visitor count for one attraction over different time periods			
Time: _____	**Time**: _____	**Time**: _____	**Time**: _____

Tourist attraction	Number of activities	Visitor count

Tourism

Questions related to (variable) + e.g. of a question
Sampling (e.g. systematic sampling, where every 5th visitor is chosen OR random sampling, where numbers are generated using random number generator)
Decide on location (e.g. entrance / exit) + time → high volume of visitors
Control measures

Survey using questionnaire

- Design

Aspect	Explanation
1. **Length**	○ Questions must address hypothesis
2. **Question types**	○ Begin with closed questions ■ Fixed set of answers to choose from ■ Profile of tourists (e.g. age group in range of ages) ○ End with open-ended questions ■ Ask for opinions (related to hypothesis) Types of questions: Open Free response Closed Choice of answers given Multiple choice Yes / no Scale Range of numbers (on a scale of __ to __)

Land use survey

1. Find out type + distribution of land use
2. Select appropriate categories of land use + tabulate
3. Data presentation: **land use map**

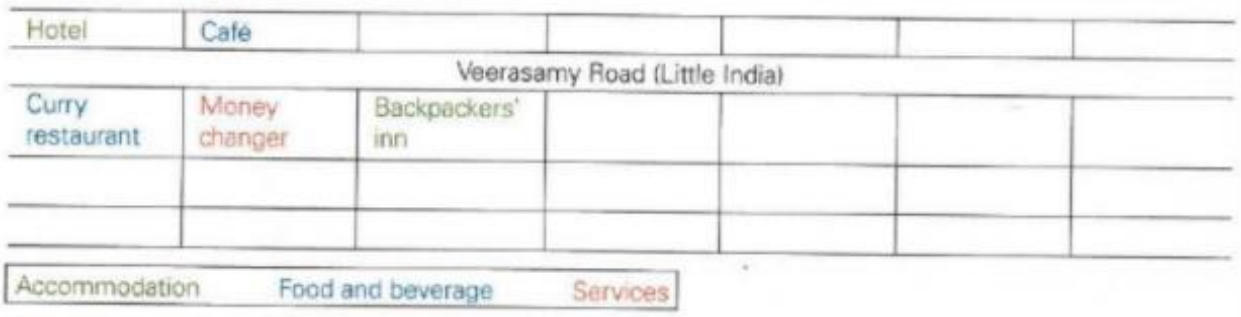


Figure 1.96 An example of a land use survey.

Type of land use	Number found in the area
Hotel	4
Inn	2

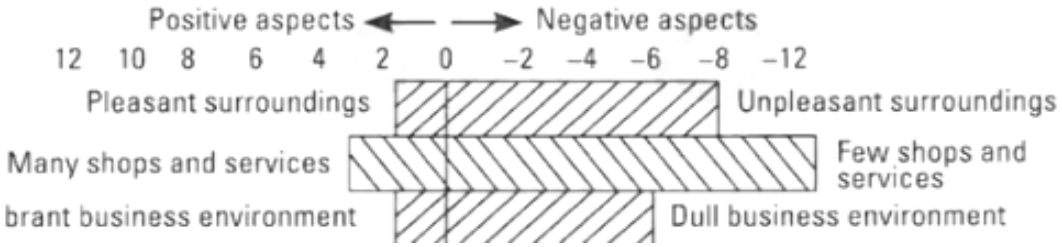
Figure 1.97 An example of tabulated land uses.

Bipolar survey: study how people perceive & evaluate places

- Adv: collect quantitative data → easy to interpret (present data in numerical form)
- Use pairs of contrasting attributes → investigate respondents' perception
- Score given to each attribute
- Data collection:

Bipolar survey on environmental perception of Little India						
Positive aspects	**+2**	**+1**	**0**	**-1**	**-2**	**Negative aspects**
Pleasant surroundings	0	2	0	8	0	Unpleasant surroundings
Many shops and services	0	3	0	1	6	Few shops and services
Vibrant business environment	1	0	5	2	2	Dull business environment

- Data presentation: **standard bar graph**



Tally method: record each person / vehicle as it passes to get overall total

1. **Five bar gate**

2. **Tally counter**

Sampling

Method	Usage	Desc	Adv	Disadv
1. **Random**	Whole population available for survey	Generate randoms numbers to select who to interview (e.g. using random number generator / table)	● Can be used with large sample populations ● Reduce biasness ● Simple and quick	● Poor representation of total population if large areas are not hit by random numbers
2. **Systematic**	Sufficient representative people are available	Regular intervals (interview every __ person)	● Effectively cover large area of study ● Simple to understand & carry out ● Reduce biasness	● More biased ○ not all have equal chance of being picked ○ Over / under representation
3. **Stratified**	Survey subgroups	e.g. choose person to interviews based on country / residence	● Effective method for ensuring better representation of total population that has known subsets ● Can be used with random or systematic sampling ● Allows for comparison study between subsets	● Exact size of subsets must be accurately determined ● Full / required information about known subsets may not be readily / easily available

Others:

- **Pilot survey** (conducted before actual survey)
  - Test questionnaire using smaller sample than planned sample size
  - Advantages:
    - Test methodology: find problems / check sample size → change methodology
    - Gain confidence & experience in doing fieldwork / practice

- **Location**: good place → fairness + reliability
  e.g. Which would be a better location to conduct a survey at a tourist site?

Location	Group of people
Entrance	Tourists entering & exiting
Car park	Local residents Domestic / international tourists

- Time

Weather and climate

Measuring instruments

Instrument	Measure	Steps
Max and min thermometer	temperature	Place in Stevenson screen where it is kept out of direct sunlight
Rain gauge	rainfall	1. Place rain gauge at suitable location in open area, away from obstructions → rainfall X intercepted by obstructions 2. Sink rain gauge into ground (30 cm protuding above ground) → X fall over → rain water X splash (inaccurate readings) 3. Pour collected water into measuring cylinder 4. Read water level at eye level → X parallax error
Sling psychrometer	relative humidity	1. Dip wick of wet bulb thermometer in water 2. Swing psychrometer at consistent + comfortable pace + hold far from body → X pick up body heat 3. Read temp on wet bulb thermometer after 1 min swinging + take reading at eye level → X parallax error 4. Calculate diff b/w wet & dry bulb temp → obtain wet bulb depression 5. Use conversion table to determine RH
Anemometer	wind speed	1. Hold up anemometer in open area, away from obstructions where wind flow freely 2. Read wind speed off display on anemometer
Wind vane	wind direction	1. Hold away from body, above head in open area, away from obstruction where wind blow directly 2. Use compass to determine positioning of wind vane (‘N’ points north) 3. Record direction wind vane points to = direction where wind blow **FROM**
Barometer	air pressure	1. Check that movable pointer arranged over measuring hand to mark current pressure 2. Determine pressure (measuring hand moves according to pressure)

Data presentation (graphs)

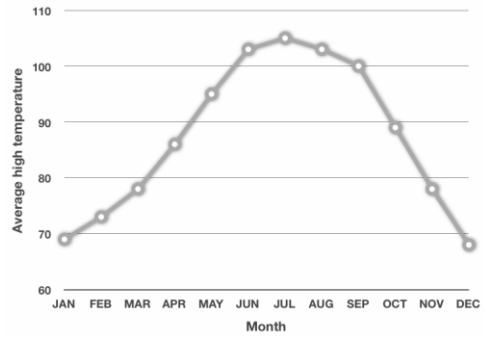
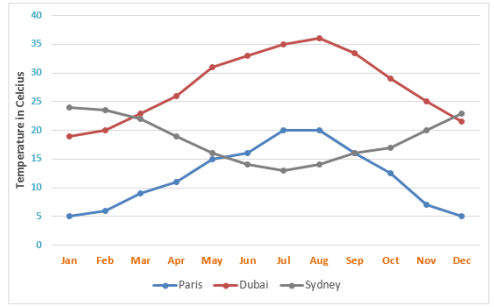
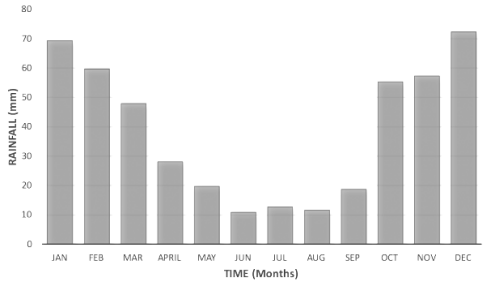
Graphs

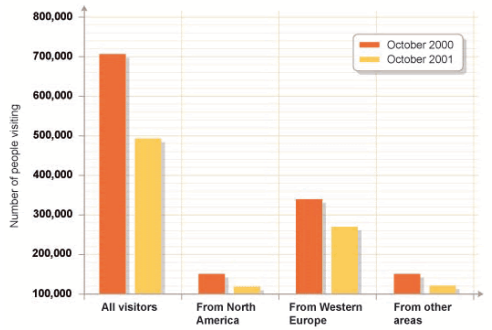
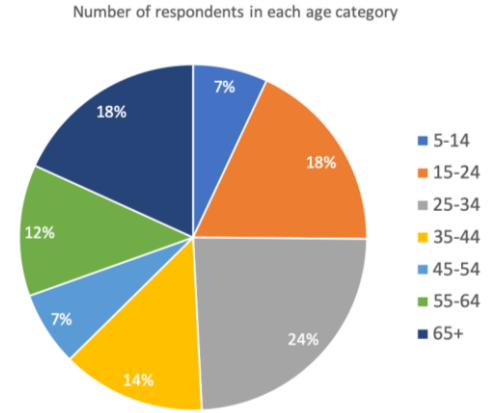
- Data:
  1. Continuous: values within a range (e.g. temperature)
  2. Discrete: individual separate values (e.g. rainfall)

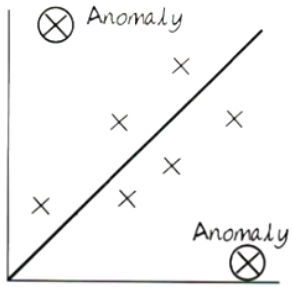
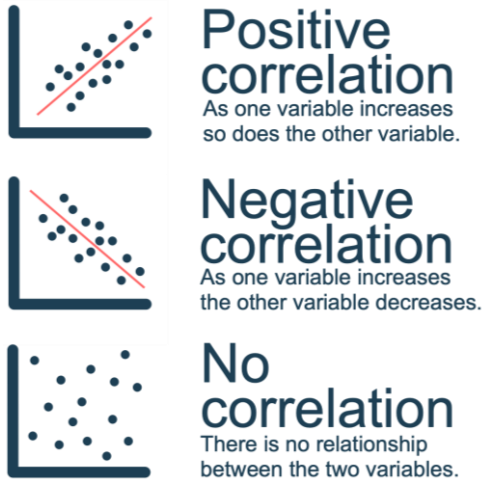
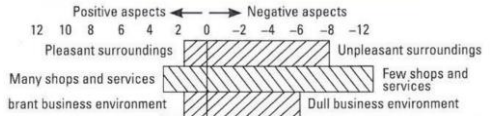
- Types of graphs:
  1. **Line graph**: simple, comparative
  2. **Bar graph**: simple, comparative
  3. **Pie chart**
  4. **Scatter graph** + best fit line

- Data in graph

Data	Continuous	Discrete
Graph	Line graph	Bar graph Pie chart Scatter graph

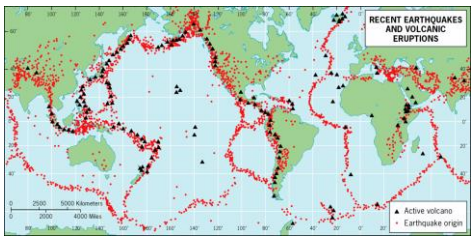
Graph	Description	Steps to construct	Sketch
Simple line graph	• 1 dependent + 1 independent variable • 1 data set	1. Decide independent and dependent variable 2. Plot data values on the graphs using a cross + connect all crosses with a single line 3. Insert title + label axes + include measurement units	
Comparative line graph	• > 1 dependent + 1 independent variable • 2 or more data sets to be compared		
Simple bar graph	• 1 dependent + 1 independent variable • 1 data set		

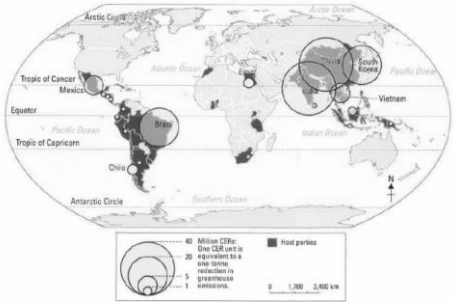
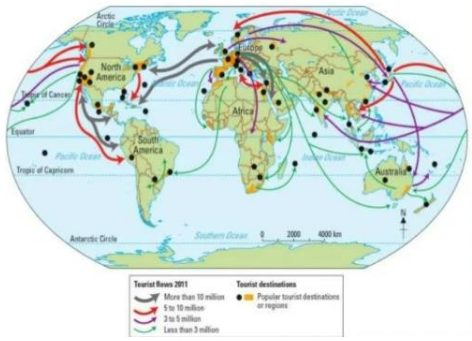
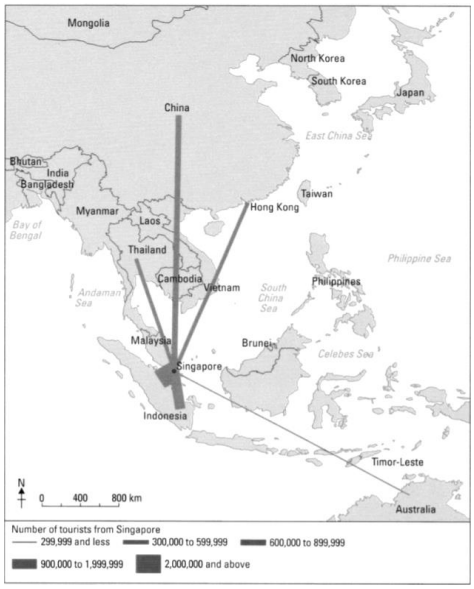
Comparative bar graph	• > 1 dependent + 1 independent variable • 2 or more data sets to be compared		
Pie chart	• Obtain degree value (circle) • Presented in % → use % in drawing conclusion, not degree		

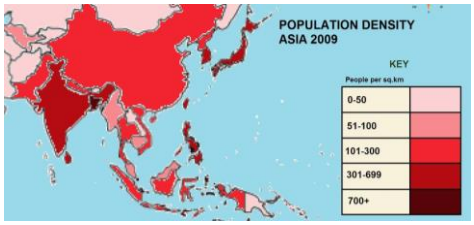
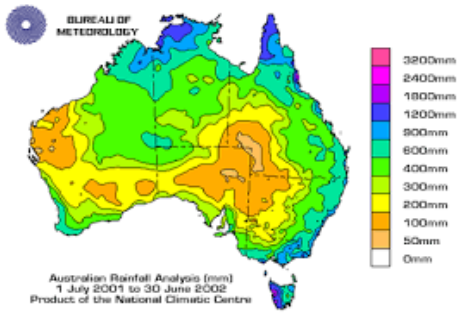
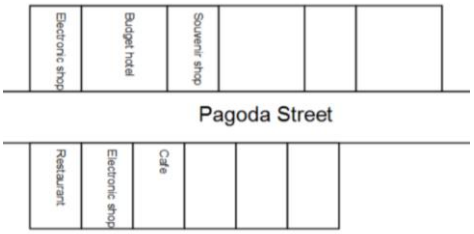
Scatter graph*	• Relationship b/w 2 sets of data • Ignore anomalies when drawing best fit line 	1. Plot (independent variable) on x-axis 2. Plot (dependent variable) on y-axis 3. Draw line of best fit to determine positive / negative correlation	
Standard bar graph [bipolar survey]		1. Overall positive / negative 2. Compare total score for positive & negative aspects (greater / smaller)	

Data presentation (maps)

Map	Description	Figure

1. **Dot map**	• Dots → distribution of data
	  ○ fixed size / value
	  ○ drawn on a base map
		

2. **Map with proportional symbols**	Symbols (e.g. circles) are proportional to values of data being mapped Refer to legend to estimate value	
3. **Flow line map**	Thickness / width of lines proportional to values of data represented	
4. **Desire line map**	Thickness / width of line proportional to value of data	

5. **Choropleth map**		
6. **Isoline map**		
7. **Land use map** [land use survey]		
8. **Recording sheet**	1) Have questions to find out where visitors come from / country of origin 2) Data collected is tallied using traditional tally method 3) Data collected is recorded in table on recording sheet according to country of origin 4) Include location + date of survey	Site: Date: Weather: Time from: to: No of vehicles on far side of road / No of vehicles on near side of road Tally Total

Conclusion

Analyse data by identifying relationship → look for **patterns / trends**

Conclusions

- Use graph to confirm whether hypothesis is proven or not proven; valid or invalid; accepted or rejected
  - If proven true/valid, do support it with data
  - If not proven true/valid, also must support it with data
- If some data collected supports hypothesis but some does not
  - DO NOT state that hypothesis is valid to some extent'
  - State that hypothesis is valid and use data to support it
  - Then, state that, however there are anomalies / exceptions and we will state these anomalies and support them with data

Note:

- Take note of patterns / trends when describing relationship between 2 variables
- Must support answer with relevant data
- Refer to the correct axis for the 2 variables
- Address 'how far' element: state anomalies as counterargument

What conclusion can be drawn from the data, in response to the student's hypothesis?	
State conclusion (ATQ)	Generally, the shorter the travelling distance to Yogyakarta, the more visitors.
Quote data that complies with trend	● Visitors from Indonesia, which is the nearest to the Borobudur Temple, has the highest number of visitors at 19. ● Similarly, Malaysia, which is near Borobudur Temple, has the second highest number of visitors at 12. ● France and UK, which are further away from Borobudur Temple, have fewer visitors at 2 each. ● Brazil, which is further away than France and UK, has the least visitors at 1.
Anomalies + data	**However,** ● Though USA is as far as Brazil from Borobudur Temple, it has more visitors at 9, compared to Brazil at 1. ● Singapore and Thailand are nearer to Borobudur Temple than USA, but have fewer visitors at 7 and 8 respectively, fewer than USA at 9. ● China is further away from Borobudur Temple than Singapore, but has more visitors at 10 compared to Singapore at 7.

One student stated that temperature and relative humidity might be inversely related. How far does the information confirm this?	
State stand (ATQ)	Data largely supports / confirms that temperature and relative humidity are inversely related.
Quote data that complies with trend	For most of the time in January and April, as temperature increases, relative humidity decreases. ● Fig. 2: from 07:00 to 11:00, as temperature increases from 25°C to 28°C, relative humidity decreases from 94% to 75%. ● In Fig. 3, from 07:00 to 11:00, as temperature increases from 27°C to 32°C, relative humidity decreases from 89% to 64%.
Anomalies + data	**However,** there are exceptions/anomalies for both January and April. ● Fig. 2: from 11:00 to 13:00, temperature remains constant at 28°C but relative humidity increases from 75% to 77%. ● Fig. 3: from 11:00 to 13:00, temperature remains constant at 32°C but relative humidity decreases from 64% to 59%.

Post-fieldwork

Post-fieldwork:

Steps	Explanation
1. **Reflect** on reliability of data	● Physical conditions of fieldwork site ● Weather conditions during data collection ● Scope + frequency of data collection ● Occurrence of human errors
2. **Evaluate** data collection methods	● Assess methods ● Suggest improvements on method

*accuracy & reliability!!

Accuracy	**Reliability**
● Proper handling of instrument ● Minimal parallax error	● Wider data scope (collect data from more sites) ● Higher data frequency (more samples / readings per site) + take average ● Take readings on more days

Weather and climate

Measurement	Accuracy	Reliability
Rainfall (rain gauge)	1. Sink into ground 30 cm protuding above ground → rainwater X splash (inaccurate readings) 2. Place in open area → dripping from eaves / leaves X enter bottle (higher readings) 3. Take reading at eye level → X parallax error	
Temperature (max min thermometer)	Stevenson screen: 1. Place 1.5 m above ground → X absorb long-wave radiation 2. X place too close to building / heat source Thermometer: 3. Place away from body → X capture body heat 4. Read meniscus 5. Take reading at eye level → X parallax error	
Relative humidity (sling psychrometer / wet-and-dry bulb thermometer)	1. Hold a distance away from body → prevent body heat from affecting readings 2. Have same student swing + take reading → ensure consistency in readings + minimise reading error 3. Collect data at same location → ensure consistency 4. Swing at steady, consistent pace → too quickly causes more evaporation, resulting in lower temp for wet bulb reading 5. Avoid standing near building / under direct sun → more evaporation, resulting in inaccurate readings 6. Take reading at eye level → prevent parallax error	
Wind speed	1. Place in open area → X block	

(anemometer)	flow of wind 2. Hold above head → free flow of wind	
Wind direction (wind vane)	1. Place in open area → X block flow of wind 2. Hold above head → free flow of wind 3. Use compass to determine positioning → record accurate directions	
Air pressure (barometer)		