JC2 H2 2018 Prelims Marking Guide
Section A

Theme 4: Geographical Investigation

1 A group of 8 students were tasked to undertake a primary fieldwork on investigating infiltration on different landuse. The group selected a study area in Coney Island with possible sites of varying landuse.

The group was divided up into two teams of four to measure the infiltration rates at two different sites. One site (Site A) was a site covered with grass. The other site (Site B) was located on a beach with sandy soil. Both teams carried out the primary investigation at Sites A and B in the study area in Resource 1 on 3 September 2018 (Monday).

Teams were each given the following equipment to gather primary data on infiltration rates:

- Milo Tin (as infiltration tube)
- Ruler
- Stop watch
- Water

The infiltration rate was calculated by finding out the time it took for water level in the cylinder to fall by 1cm. The time took for the water level to drop by 1cm was defined using a ruler and personal observation. The data collected was recorded using a data collection sheet.

Resource 1 shows the map of both Sites A and B. Resource 2 shows the land use associated with each site. Resource 3 shows the data collected by one of the teams to calculate the infiltration rates associated with each site.

(a) With reference to Resource 2, suggest a suitable hypothesis and provide **two** reasons why it is at a suitable scale. [3]

Award 1 mark for any testable and sensible related to type of landuse and the infiltration rate.

Possible response include:

- Hypothesis: Infiltration rate is lower at Site A, which is a vegetated area, compared to that on Site B, which is a sandy beach.
- It is at a suitable scale as it has a clearly defined research areas – the role of landuse in affecting the infiltration rate
- Sites of differing landuse – sandy beach and vegetated area
- 2 sites which are of close proximity
- Task is within the capability of the students

Point Marked

(b) Explain how both teams can minimise the risks in carrying out their primary investigation at Sites A and B as shown in Resource 2. [4]

Possible responses include:

- Risk: General safety

- Do a reconnoitre trip to map out places of potential hazards and places that can give first aid (e.g. clinics) – also to identify a shelter area during the bad weather conditions
- Check weather forecast and to do data collection on another day if the event of bad weather.
- Ensure that there is first-aider and first aid kit for both teams
- Wear proper footwear to protect from sharp objects
- Wear hats or use umbrella when the weather is too hot and have proper hydration

- Risk: Water safety at Site B
  - Check high tide and low tide time and be aware of the high tide mark on the beach at Site B

- Risk: Timing of primary data collection
  - Ensure that the data collection is done in the morning and avoid afternoon when it could be too hot and possible problem of dehydration
  - Stop investigation before sunset as the late timing may lead to students reaching home very late, issues of safety

Award 2 marks for a strategy to minimize the risk identified.

(c) With reference to Resources 1 and 2, explain how the students might have carried out their primary fieldwork on investigating infiltration on different landuse. [8]

Indicative Content:

- **Developing a plan:**
- Data: establish the data needed to prove the hypothesis, e.g. primary data (quantitative) of infiltration rates will have to be collected at each site
- Timing: to conduct the investigation on one weekday afternoon
- **Data Collection:**
- Sampling method: random stratified sampling with the selection of two sites – Site A, a vegetated area and Site B on a sandy beach
- In the field:
  - Mark the inside of the milo tin with a line for every 1 cm, up to 15cm.
  - At the respective sites, twist the milo tin (which is the infiltration tube) 10-15cm into the soil
  - Place a ruler inside the milo tin to measure the fall in water level.
  - Pour water into the milo tin to a depth of 10 cm
  - As the water level decreases by every 1cm, take a recording of the time elapsed.
  - Record the data in the recording sheet.
  - Repeat two times to get an average timing for each site.
- **Consider research ethics:** e.g. to obtain permission to conduct the investigation in coney island, consideration for the other park users; minimize noise disturbance, avoid littering, minimise the effects of trampling on the vegetated areas, fill up any voids caused by the investigation
- **Consider limitations:** e.g. the tools used, limitations of data collected, e.g. one area may not be conclusive to prove the relationship between landuse and infiltration rate
- **Present and analyse data collected:** establish a data representation method e.g. line graph to represent the infiltration rates. Compare the line graphs between the two sites. Interpret the data in relation to the hypothesis posed

Levels marked:

Level	Marks	Descriptors
3	**6-7**	Response demonstrates accurate knowledge of geographical investigation methods. Outlines a relevant and coherent plan with reference to data collection, methods, investigation limitations and risk mitigation strategies. Response is relevant to context of question throughout
2	**3-5**	Response demonstrates some knowledge of geographical investigation methods. Outlines a clear plan with some reference to data collection, methods, investigation limitations and risk mitigation strategies. Response is mostly relevant to context of question but may lack clarity and coherence.
1	**1-2**	Response demonstrates limited or no knowledge of geographical investigation methods. Outline of plan is limited and may not refer to one or more of the facets of an investigation in their outline plan. Much of the response may not be relevant to context of question.
0	**0**	No creditworthy response

(d) Suggest **two** other pieces of information that may be useful in understanding infiltration rates at both sites. [5]

Possible responses include:

- Data on rainfall; relate to soil antecedent moisture condition
- Soil samples; relate to soil type and its characteristics, e.g. permeability and porosity
- Anthropogenic activity, e.g. frequency and type of human activities on both sites

Levels marked:

Level	Marks	Descriptors
3	**5**	Response demonstrates accurate knowledge of factors that can affect infiltration rate. Insightful explanation of the factors with references to characteristics of both sites.
2	**3 – 4**	Response demonstrates good knowledge of other factors that can affect infiltration rate. Explanation may be limited in depth and detail. Some references made to the context of both sites.
1	**1 – 2**	Response shows some knowledge of factors that can affect infiltration rate. Inappropriate or incorrect explanation of factors. Response may be of limited relevance to the given context.
0	**0**	No creditworthy response.

(e) The group concluded that data collected as shown in Resource 3 may not be completely reliable and/or accurate. Explain how the process of data collection can be improved. [5]

Indicative Content:

- **Data collected:**
- The data collected may not be sufficient to provide a good overview of how varying landuse can affect infiltration rate as only 2 varying landuse were considered. Can expand investigation to areas of other landuse, e.g. construction site

- **Timing:**
- The collection of data is only taken once at one particular point at each site. Repeated measurements (at least 2) and taking the average can reduce the margin of error.
- To conduce the fieldwork on another day at the same timing so that it is more representative of finding out the infiltration rate in the day
- Try to conduct the measurement on a day with no rain so as to eliminate the influence of the soil antecedent moisture from the rainfall
- **Human Error:**
- Ensure the same person is reading the data so as to eliminate the element of human error
- Try to read the reading at the eye level to reduce parallax error.
- **Equipment:**
- Proper equipment, an infiltrometer, should be used to collect data to increase the accuracy of data

Levels marked:

Level	Marks	Descriptors
3	**5-6**	Response demonstrates accurate knowledge of data collection methods, issues with both accuracy and/or reliability of these and relevant improvements. Reflects a good understanding of the context of the investigation and of data collection techniques.
2	**3 – 4**	Response demonstrates good knowledge of data collection methods. Provides an explanation of issues relating to reliability and/or accuracy with some reference to possible improvements. Description may be limited in depth and detail.
1	**1 – 2**	Response shows some knowledge of relevant data collection methods. Some reference is made to issues with accuracy and reliability but may recommend inappropriate or irrelevant improvements or provide incorrect explanation of methods. Response may be of limited relevance to the given context.
0	**0**	No creditworthy response.

Section B

Theme 1: Tropical Environments

Climatic conditions and anomalies in Africa

2 Resource 4 shows monsoon winds and ITCZ over Africa in January and July and number of days per month with measurable rainfall. Resource 5 shows climatic zones in Africa and location of Sites X and Y. Resource 6 shows the climographs for Sites X and Y. Resource 7 shows soil profiles taken at Sites X and Y.

(a) With reference to Resource 4, describe the patterns of measurable rainfall in January and July. [4]

Possible responses:

- Overall: there is a reversal in areas with high and low rainfall between January and July.

Specifics:

In January

- Areas with high rainfall, with more than 16 days per month with measurable rainfall, are generally found concentrated in East Africa and Madagascar, between the latitudes of 0-20˚S.
- Areas with low rainfall, between 0-5 days per month with measurable rainfall are in found in West Africa between the latitudes of 0-20˚N

In July,

- Areas with high rainfall, with more than 16 days per month with measurable rainfall, are generally found concentrated in West Africa, between the latitudes of 0-20˚S.
- Areas with low rainfall, between 0-5 days per month with measurable rainfall are in found in East Africa between the latitudes of 0-20˚N

- Anomaly: Madagascar has at least 2-15 days of measurable rainfall per month.

Point marked.

(b) With reference to Resource 4, account for the patterns of measurable rainfall in January and July. [5]

Possible responses:

- The main two components of the African Monsoons are 1) the West African Monsoon, and 2) the East African Monsoon
- The monsoon winds are formed due to the reversal of land and sea temperatures between Asia and the Pacific and Indian Oceans during the summer and winter → hence monsoon winds occur during the NH's summer (mid-year monsoon) and winter months (year-end monsoon)
- As the large landmass of Asia, has a low specific capacity, gains and loses heat more quickly than the surrounding oceans, the continent develops a strong centre of low pressure in summer and high pressure in winter

West African Monsoon

- DRY → In January, West Africa tends to be dry as warm, dry monsoon winds, also known as dry harmattan, are blowing from Sahel and Sahara Region
- WET → In July, Monsoon rainfall over West Africa occurs due to low level southwesterly flow of monsoon wind and rain from the Atlantic Ocean and the Inter-Tropical Convergence Zone (ITCZ) north of the equator.

East African Monsoon

- WET: The East African Monsoon winds and rain are often the extension of mid-year and year-end monsoon. They are associated with the ITCZ moving south of the equator, drawing trade-winds with rain. The so-called long rains prevail during winter to spring months.

Levels marked.

Levels	Marks	Descriptors
3	5	Response demonstrates accurate knowledge and understanding of the formation of monsoon in both July and January. Explanation is detailed, thorough and relevant. Good reference made to resources and relevant information used to substantiate response
2	3-4	Response demonstrates adequate knowledge and understanding of concept of the formation of monsoon. Explanation is valid but may be somewhat limited in relevance and detail and limited reference to resource.
1	1-2	Response demonstrates little or no knowledge and understanding of the formation of monsoon. Explanation lacks detail and makes little or no reference to resource. Overall, the response does not address the context of the question
0	0	No creditworthy response

(c) Describe the rainfall patterns of Sites X and Y as seen in Resource 6. [3]

Possible responses:

- Site Y has higher amount and greater seasonality rainfall as compare to Site X.
- Site Y has 1841mm and Site X has 202.5mm of annual rainfall.
- Site Y has highest rainfall of around 220mm in October and lowest of 100mm in January as compared to Site X with highest rainfall of around 80mm in August and lowest of 0mm in at least 6 months from November to April.

Point marked.

(d) Compare the soil profiles for Sites X and Y as seen in Resource 7. [4]

Possible responses:

- Differ in terms of soil depth, soil colours, soil horizons
- Site Y has deeper soil depth of 30m as compared to Site X of 80cm.

- Site Y has reddish soil colour and Site Y has soil of lighter brown and white deposits (calcium)
- Site Y has thin layer of O-horizon, humus (dark brown) and thick vegetation cover however Site X has limited/no O-horizon, with no vegetation cover.

Point marked.

(e) With reference to Resources 5, 6 and 7 and your own knowledge, evaluate the extent to which climate can account for the development of soil profiles as shown in Resource 7. [9]

Indicative content:

- Candidates should demonstrate an understanding of the impacts of the factors on the soil profiles of humid tropics and arid tropics. Answer will need to make clear links to explain how factors can result in the different aspect of the soil profile (e.g. thickness, texture, colour) of both humid and arid tropics.
- Responses to link climate, climate-related factor (vegetation cover) and parent rock to the formation of different soil profiles in the tropics.
- A high level response will acknowledge the spatial variations in the soil profiles, where climate play a more significant role with its global scale of influence.

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Level	Marks	Descriptors
3	7-9	Response demonstrates a clear knowledge and understanding of the context in the question. Uses relevant, detailed and accurate factual information and conceptual understanding. Reflects strong critical thinking skills and may include perceptive insights for the strongest responses. Source (s) is well used to support the response. Provides a logical and well-developed evaluation well founded on evidence and/or different viewpoints. OR Makes a decision which clearly addresses different elements of the issue and/or interest of different stakeholders.
2	4-6	A satisfactory response which is generally sound and contains relevant points, but may not always focus on the context in the question. Uses factual information and conceptual understanding that is generally appropriate to the given context but lacks details and may contain some inaccuracies. Displays general critical thinking skills. Source (s) is used to support parts of the response. Provides an evaluation, which may be limited in depth and sufficient elaboration in some parts. OR Shows some attempt to address different elements of the issue and/or views of different stakeholders when making a decision but is not well-developed.

1	1-3	Response shows a poor understanding of the context in the question. Uses basic factual information and conceptual understanding which has some, but limited relevance to the question. Source (s) is not used or not accurately used to support the response. Provides little or no evaluation. OR Evidence of decision-making, if present is simple and may be flawed.
0	0	No creditworthy response.

Theme 2: Development, Economy and Environment

Samsung's Global Production Networks (GPNs)

3 Samsung is a TNC which operates globally via its extensive production networks. Resource 8 shows the global network of Samsung Electronics. Resource 9 shows changes in share of smartphone shipments in China between 2013 to 2014. Resource 10 shows the flows in cobalt processing, which is a key component of GPNs of smartphone manufacturers like Samsung. Resource 11 depicts cobalt mining in the Democratic Republic of Congo (DRC) which supplies more than half of the world's demand for cobalt.

(a) Describe the trends in location of Samsung's global production bases as shown in Resource 8. [3]

Point marked.

- Largest no of production bases is concentrated in Asia (28 out of 38)
- China makes up nearly half of this proportion (13) and has the highest number of production bases.
- Least no in Africa (only 1)
- Absence of production base in Australia

(b) Explain the implications of keeping production 'in-house' as depicted in Resource 8. [5]

Indicative content:

- Able to have greater control over production processes, avoid reliance/dependence on subcontractors, maintain competitive advantage by keeping technological developments in-house
- However, this may affect cost effectiveness due to need to invest in production bases, may not be able to tap on comparative advantage of subcontractors

Levels Marked:

Level	Marks	Descriptors
3	**5**	Response demonstrates accurate knowledge of production processes of TNCs and implications of in-house production. Explanation is detailed, thorough and relevant. Reference made to resource in response and information from resource used to substantiate response.
2	**3-4**	Response demonstrates adequate knowledge and understanding of production processes of TNCs and implications of in-house production. Explanation is valid but may be somewhat limited in detail. Some of the response may not fully address the context of the question. Limited reference made to resource,

1	**1-2**	Response demonstrates limited or no knowledge and understanding of production processes of TNCs and implications of in-house production. Explanation lacks detail. Overall the response does not address the context of the question. No reference made to resource.
0	**0**	No creditworthy response

(c) Suggest reasons for Samsung's changing market share in China as shown in Resource 9. [5]

Indicative content:

- Samsung's market share has significantly reduced in a year from 18% to 8%
- This could be due to reasons such as increasing attractiveness of competitors' products (Apple and Xiami has an increasing market share of more than 5%)
- It could also be due to government policies to protect home grown companies such as Xiaomi which makes the product more competitive in terms of pricing
- This could also be due to larger no/entrance of new competitors in the smartphone market in China which leads to a lower market share despite high no of units sold

Levels Marked:

Level	Marks	Descriptors
3	**5**	Response demonstrates accurate knowledge of market share of TNCs and factors accounting for changes. Explanation is detailed, thorough and relevant. Reference made to resource in response and information from resource used to substantiate response.
2	**3-4**	Response demonstrates adequate knowledge and understanding of market share of TNCs and factors accounting for changes. Explanation is valid but may be somewhat limited in detail. Some of the response may not fully address the context of the question. Limited reference made to resource,
1	**1-2**	Response demonstrates limited or no knowledge and understanding of market share of TNCs and factors accounting for changes. Explanation lacks detail. Overall the response does not address the context of the question. No reference made to resource.
0	**0**	No creditworthy response

(d) With reference to Resource 10, describe the GPNs of batteries for smartphone companies. [3]

Point marked.

- Primary product of cobalt is obtained from mines in DRC
- This is then processed in China and then sent to factories in Asia like Japan, South Korea and China to make batteries
- These batteries are then supplied to smartphone companies in US and Europe

(e) With reference to Resources 10 and 11 and your own knowledge, discuss the impacts of GPNs on developing countries like the DRC. [9]

Indicative content:

- Resource 10: reflects that GPNs can incorporate countries like DRC which are rich in natural resources like cobalt and it is able to participate as a trading centre. However, this can also reflect that these countries often may not benefit in terms of value adding of their product, as seen as cobalt is sent to be processed in countries like China and made into batteries in other countries which are in high demand.
- Resource 11 can depict that GPNs can provide employment for the locals who are involved in extracting the minerals. However, there are often issues of underpaid and exploited labor (child labour) which can affect the social development of these countries. Moreover, the resource also shows water pollution in the background as a result of extensive mining activities.
- Own knowledge: developing countries can benefit economically through employment, revenues etc. However, depends on the nature of industries and

role of governance. Environmentally, there could be irreversible damages which could result (water pollution, deforestation etc)

- Candidates should be able to form an opinion/judgement based on the points raised and support it with relevant information on developing countries.

Levels marked:

Level	Marks	Descriptors
3	**7-9**	Response demonstrates clear knowledge and understanding of the context in the question. Uses relevant, detailed and accurate factual information and conceptual understanding. Reflects strong critical thinking skills. Source(s) is well used to support the response. • Provides a logical and well-developed evaluation well founded on evidence and/or different viewpoints. **OR** • Makes a decision which clearly addresses different elements of the issue and/or interests of different stakeholders.
2	**4-6**	A satisfactory response which is generally sound and contains relevant points, but may not always focus on the context in the question. Uses factual information and conceptual understanding that is generally relevant to the given context but lacks detail and may contain some inaccuracies. Displays general critical thinking skills. Source(s) is used to support parts of the response. • Provides and evaluation, which may be limited in depth and insufficient evidence and support used. **OR** • Shows some attempt to address different elements of the issue and/or views of different stakeholders when making a decision but is not well-developed or exemplified.
1	**1-3**	Response shows a poor understanding of the context in the question. Uses basic factual information and conceptual understanding which has some, but limited, relevance to the question. Source(s) is not used or not accurately used to support the response. • Provides little or no evaluation. **OR** • Evidence of decision-making, if present, are simple and may be flawed and contains no reference to views of stakeholders.
0	**0**	No creditworthy response.

Theme 3: Sustainable Development

Liveability in Australia

4 Australian cities are often ranked highly in liveability indicators. Resource 12 shows ranking of cities in 2 different liveability measures. Resource 13 depicts affordability, quality of life and living costs in selected Australian cities based on an Australian investment firm. Resource 14 depicts changes in housing prices in Melbourne over a 5 year period between June 2012 and June 2017.

(a) With reference to Resource 12, compare the ranking of cities across the 2 different measures. [3]

Point marked.

- Only 3 cities appear in both rankings: Melbourne, Sydney and Vienna
- Top ranked city in Monocle is not even ranked in top 8 for EIU
- For both rankings, cities in Australia are ranked highest (4 out of 8 in EIU and tied with Germany and Japan for 2 out of 8 in Monocle)

(b) Suggest possible reasons for the variations in ranking depicted in Resource 12. [5]

Indicative content:

- Difference in indicators and weightage of factors for ranking
- Difference in surveys/respondents
- Responses should be supported by ranking shown in Resource.

Levels Marked:

Level	Marks	Descriptors

3	**5**	Response demonstrates accurate knowledge of liveability indicators and suggests accurate reasons for variations. Explanation is detailed, thorough and relevant. Reference made to resource in response and information from resource used to substantiate response.
2	**3-4**	Response demonstrates adequate knowledge and understanding of liveability indicators and suggests reasons for variations. Explanation is valid but may be somewhat limited in detail. Some of the response may not fully address the context of the question. Limited reference made to resource,
1	**1-2**	Response demonstrates limited or no knowledge and understanding of liveability indicators. Explanation lacks detail. Overall the response does not address the context of the question. No reference made to resource.
0	**0**	No creditworthy response

(c) With reference to Resource 13, suggest why there is a difference in liveability ranking between Adelaide and Darwin. [6]

Indicative content:

- Adelaide has a higher overall ranking of 2 compared to Darwin which is ranked last in the cities depicted
- This could be due to housing prices which are much lower in Adelaide which could make it more liveable due to affordability ($395201 compared to $547143)
- Could also be due to walkability which allows easy access to amenities where Adelaide has a score of 54 compared to Darwin with 45
- Another reason could be cost of living assessed by average cost of coffee where its $3.50 in Sydney compared to $4.81 in Darwin which can affect day to day expenses
- Other factors which can be explained are safety, health, culture and amenities

Levels Marked:

Level	Marks	Descriptors
3	**5-6**	Response demonstrates accurate knowledge of factors affecting liveability and suggests reasons for variations. Explanation is detailed, thorough and relevant. Reference made to resource in response and information from resource used to substantiate response.
2	**3-4**	Response demonstrates adequate knowledge and understanding of factors affecting liveability and suggests reasons for variations. Explanation is valid but may be somewhat limited in detail. Some of the response may not fully address the context of the question. Limited reference made to resource,
1	**1-2**	Response demonstrates limited or no knowledge and understanding of factors which affect liveabilty. Explanation lacks detail. Overall the response does not address the context of the question. No reference made to resource.
0	**0**	No creditworthy response

(d) With reference to Resource 14, describe the changes in housing prices in Melbourne. [4]

Point marked. Accepted answers include;

- Generally housing prices have increased in Melbourne over the 5 year period with a much lower proportion of houses which are less than $400K
- NE of the CBD have seen the greatest increase in housing prices from 600K to more than 1 million
- East of the CBD have seen greater change in housing prices compared to the West

- Radius of expensive housing (over 1m) has increased by more than double

(e) With reference to Resources 13 and 14 and your own knowledge, explain why not all residents in Melbourne may enjoy a high quality of urban living. [7]

Indicative content:

- Lower income may not enjoy a high quality of urban living because of high housing prices as seen in Resource 13 (highest in cities surveyed) and where housing prices have increased significantly over a 5 year period (Resource 14). This could price out the lower income from the housing market, pushing them further out of the city centre, affecting their quality of living if they have to commute longer distances/driven to homelessness
- Walkability score reflected in Resource 13 is 57: though its relatively high compared to other cities, residents with no cars may still find it difficult to access amenities
- If transport/amenities are not made disabled/elderly friendly, these residents may also not be able to enjoy a high quality of urban living
- Lower income migrants in Melbourne may not be given equal access to amenities or integrated into society which can affect their quality of urban living

Levels Marked:

Level	Marks	Descriptors
3	**6-7**	Response demonstrates accurate knowledge of social groups in the city and factors which can affect their quality of urban living. Explanation is detailed, thorough and relevant. Reference made to resource in response and information from resource used to substantiate response.
2	**3-5**	Response demonstrates adequate knowledge of factors which can affect quality of urban living. Explanation is valid but may be somewhat limited in detail. Some of the response may not fully address the context of the question. Limited reference made to resource,
1	**1-2**	Response demonstrates limited or no knowledge and understanding of factors which can affect quality of urban living. Explanation lacks detail. Overall the response does not address the context of the question. No reference made to resource.
0	**0**	No creditworthy response