

[Turn Over]

Section A

Cluster 4: Fieldwork

- 1 Singapore's Islandwide Cycling Network (ICN) Programme aims to support the nation's car-lite vision and encourage greener, healthier commutes. Unveiled in 2020, there are currently more than 730km of cycling paths and park connectors across the island. By promoting cycling, the initiative demonstrates how sustainable transportation can play a vital role in strengthening community efforts to combat climate change.

A group of four Junior College students were tasked to investigate the community's views and levels of participation in sustainable transportation. They were given the one-week September school holidays to conduct their investigation. They decided to test the following hypothesis:

Young adults are more likely than the elderly to adopt cycling as a form of sustainable transportation in Singapore.

The students produced a questionnaire to collect information from a total of 40 residents at two different locations in Punggol. The students split themselves into pairs, with each pair conducting questionnaires for an hour at the respective locations from 12pm on a weekday of the September school holidays.

Resource 1 is a map showing the location of the two investigation sites in Punggol. Resource 2A shows a picture of investigation Site A. Resource 2B shows a picture of investigation Site B. Resource 3 is the questionnaire used by the students. Resource 4A shows the results by age group for question 3 of the questionnaire. Resource 4B shows the results by age group for question 4 of the questionnaire.

- (a) Explain whether the hypothesis is suitable for the investigation. [3]
- (b) Suggest a suitable sampling method for the students to select participants for the questionnaire. [4]
- (c) With reference to Resources 1, 2A, and 2B, suggest how the students could minimise potential risks in conducting the survey. [4]
- (d) With reference to Resources 1, 2A, and 2B, suggest how the students could minimise the impact of their investigation at the two sites. [4]
- (e) Explain how the design of the questionnaire shown in Resource 3 can be improved. [6]
- (f) With the aid of a sketch diagram, explain how the students could better represent the data seen in Resource 4A [5]
- (g) Compare the results for question 4 for the 20-39 age group with the 60 and above age group shown in Resource 4B. [4]
- (h) Evaluate the validity of the students' fieldwork at Punggol. [10]

Section B**Cluster 3: Sustainable Future and Climate Change**

- 2** Resource 5 shows the spatial variations in ecological footprint across the world. Resource 6 shows waste generation and Gross Domestic Product (GDP) by country. Resource 7A shows the types of non-hazardous solid waste produced by income level. Resource 7B shows waste disposal methods by income level. Resource 8 shows a cartoon about a strategy to manage non-hazardous solid waste.
- (a) Describe the spatial variations in ecological footprint across the world as seen in Resource 5. [4]
- (b) Explain the difficulties faced when measuring sustainable urban development. [4]
- (c) Account for the pattern of waste generation shown in Resource 6. [5]
- (d) Contrast the types of non-hazardous solid waste produced and disposal methods between high- and low- income countries as seen in Resources 7A and 7B. [6]
- (e) Using Resource 8, suggest how the strategy to manage non-hazardous solid waste shown can impact sustainable urban development. [5]
- (f) Explain how urban population trends can hinder progress towards sustainable urban development. [6]

Section C

Answer EITHER question 3 OR question 4.

- 3** 'Issues faced by women living in the city pose the most significant hindrance to progress towards liveable cities.'

Evaluate this statement.

[20]

- 4** Evaluate the relative importance of natural and human factors in explaining contemporary climate change.

[20]