

Structured Question 1:
Fieldwork - Community Response to Climate Change

Use of Reuseable Cups in Singapore

Five students in Singapore were interested in environmentally sustainable practices, and hoped to find out how working adults in the CBD can be encouraged to use reuseable cups. They came up with the following hypothesis:

‘Working adults in the Central Business District (CBD) are likely to use reusable cups if they have to pay an additional charge for takeaway coffee cups.’

To test their hypothesis, they decided to observe customers at two different coffee outlets in the CBD on a Tuesday during the June holidays. **Coffee Outlet A** imposes an additional charge of \$0.30 for takeaway coffee cups, while **Coffee Outlet B** does not. The students split themselves into two groups, and collected data at both outlets concurrently.

At each outlet, the students sat a table to record the total number of customers and those who opted for reusable cups. They also used their handphones to take pictures of some customers. The students collected the data and pictures without asking for permission from the staff or customers at each outlet.

Following their observations and with the help of their family members, they recruited 30 adults working in the CBD to respond to an online survey to better understand their motivations in using reusable cups.

Resource 1 is a map showing the locations of Coffee Outlets A and B. **Resources 2A and 2B** show photographs of Coffee Outlets A and B respectively at 12pm. **Resource 3** shows the data collected at each coffee outlet. **Resource 4A** shows the survey form used by the students. **Resource 4B** shows the responses to selected questions from the survey.

1	(a)	Explain why the students' selection of two outlets in the CBD as shown in Resource 1 is appropriate for this investigation.	[4]
	(b)	With reference to Resources 2A and 2B, explain the possible issues related to research ethics with regard to the students' data collection at the coffee outlets.	[6]
	(c)	With reference to Resources 2A and 2B, suggest how the students can ensure the accuracy and reliability of their data in Resource 3.	[4]
	(d)	Describe the pattern in the percentage of customers using reusable cups at Coffee Outlets A and B, as shown in Resource 3.	[4]
	(e)	With reference to Resource 4A, explain the limitations of the students' survey form.	[4]
	(f)	With reference to Resources 4A and 4B, suggest how the students could improve their sampling method for the online survey.	[4]
	(g)	The students hope to conduct further research into how working adults are motivated by their friends to use reusable cups, as shown in Resource 4B. Explain the advantages of conducting interviews to collect the data.	[4]
	(h)	The students concluded that an additional charge for takeaway cups will result in higher use of reusable cups. With reference to Resources 3, 4A, and 4B, evaluate the validity of their conclusion.	[10]

Resource 1 for Question 1

Map showing the locations of Coffee Outlets A and B



Legend



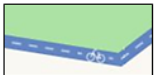
Coffee Outlet A



Coffee Outlet B



Roads



Park with bicycle path



Commercial and office buildings



Train Station

Resource 2A for Question 1

Photograph of Coffee Outlet A at 12pm



Resource 2B for Question 1

Photograph of Coffee Outlet B at 12pm



Resource 3 for Question 1

Data collected at each coffee outlet

Time	Coffee Outlet A (additional charge for takeaway cups)		Coffee Outlet B (<u>no</u> additional charge for takeaway cups)	
	Total no. of customers	No. of customers using reusable cups	Total no. of customers	No. of customers using reusable cups
8.30 – 10.30 am	31	8 (25.8%)	16	5 (31.3%)
12 – 2 pm	76	15 (19.7%)	64	16 (25.0%)
5 – 7 pm	81	10 (12.3%)	73	8 (11.0%)

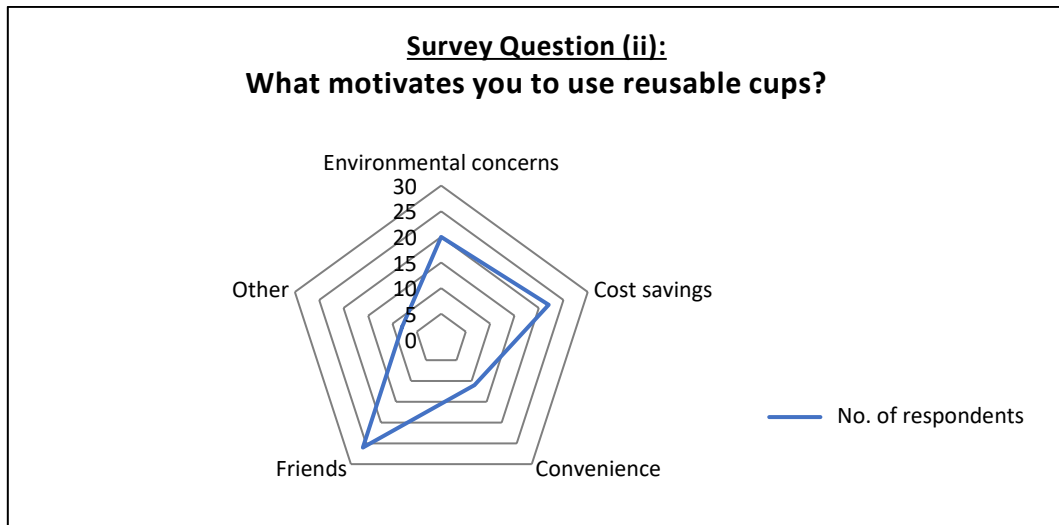
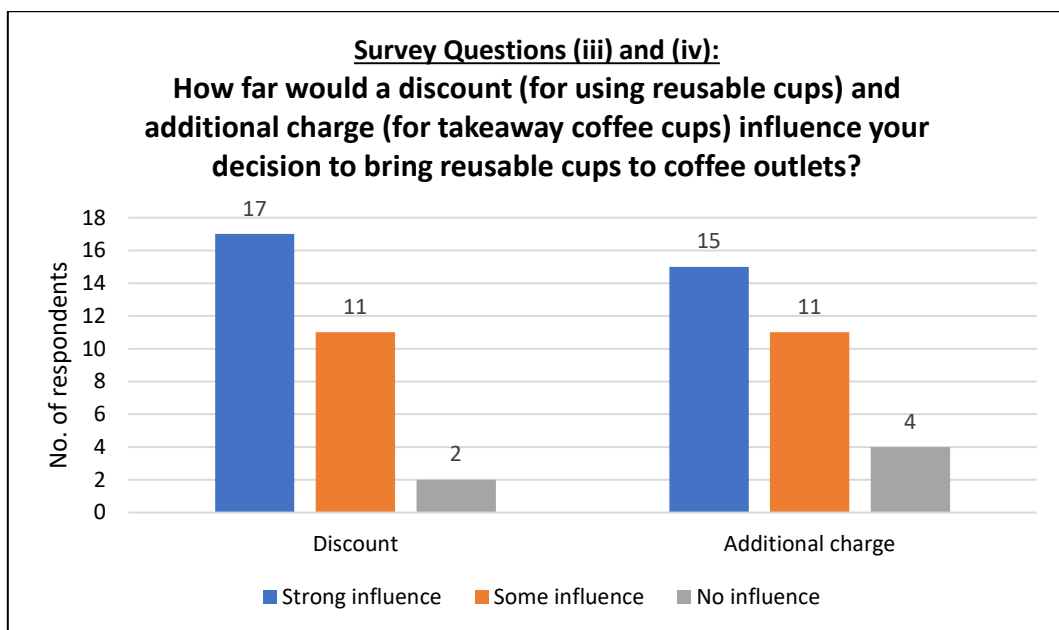
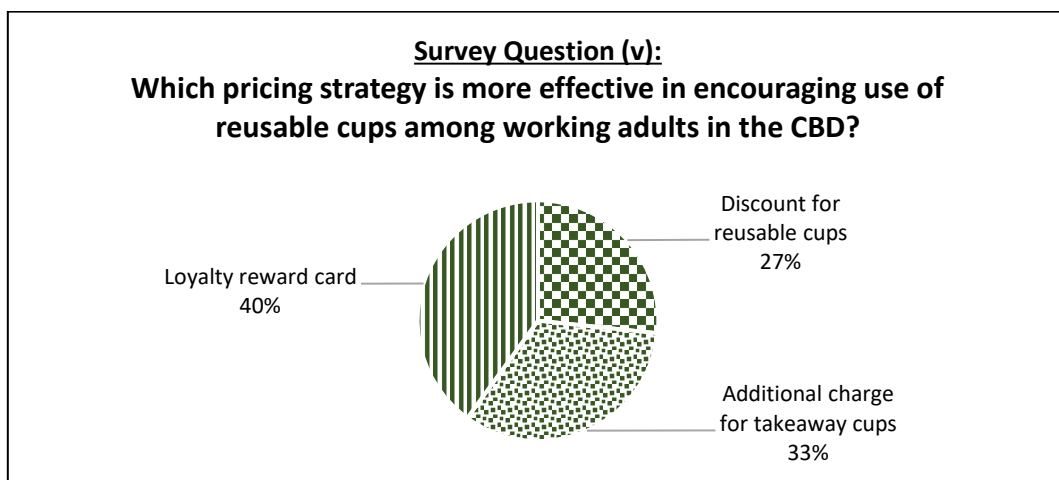
Resource 4A for Question 1

Survey Form

Name: _____	
Age: _____	
(i)	Do you currently use reusable cups when purchasing drinks from coffee outlets in the CBD?
	☐ Yes ☐ No
(ii)	If you answered "Yes" to the previous question, what motivates you to use reusable cups? (Select all that apply)
	☐ Environmental concerns ☐ Cost savings ☐ Convenience ☐ Friends who also use reusable cups ☐ Other (please specify)
(iii)	How far would the availability of a discount for using reusable cups influence your decision to bring reusable cups to a coffee outlet?
	☐ Strong influence on my decision ☐ Some influence on my decision ☐ No influence on my decision
(iv)	How far would the imposition of an additional charge for takeaway coffee cups influence your decision to bring reusable cups to a coffee outlet?
	☐ Strong influence on my decision ☐ Some influence on my decision ☐ No influence on my decision
(v)	In your opinion, which pricing strategy (discount for reusable cups or additional charge for takeaway cups) is <u>more effective</u> in encouraging the use of reusable cups among working adults in the CBD?
	☐ Discount for reusable cups ☐ Additional charge for takeaway cups ☐ Loyalty reward card for using reusable cups (e.g. provision of a rebate or free drink with every 10 stamps collected)

Resource 4B for Question 1

Responses to Selected Survey Questions



Suggested Marking Scheme

1	(a)	<p>Explain why the students' selection of two outlets in the CBD as shown in Resource 1 is appropriate for this investigation.</p> <p>Award 1 mark for each explanation of why the students' selection of two outlets in the CBD is appropriate for the investigation, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <p>Possible responses include:</p> <ul style="list-style-type: none"> • The locations of the two outlets within the CBD allow the students to observe the consumer behaviour of working adults more easily [1 mark]. The two outlets are located within commercial and office buildings within the CBD, which makes it more likely that the customers patronising these coffee outlets are adults working in the CBD or in these particular buildings [1 additional mark]. • The different pricing structures (for takeaway cups) at the two coffee outlets allow the students to investigate the specific influence of an additional charge (as a variable) more easily [1 mark]. This allows the students to better test their hypothesis, as the absence of an additional charge at Coffee Outlet B can act as a control in their investigation [1 additional mark]. • The close proximity of the two coffee outlets makes it more manageable for the students to collect their data and discuss their findings in one day [1 mark]. For example, students only need to walk less than 100m along the roads to get from one coffee outlet to another, allowing the students to meet up more easily to discuss their findings following the collection of data [1 additional mark]. <p>AO2</p>	[4]
	(b)	<p>With reference to Resources 2A and 2B, explain the possible issues related to research ethics with regard to the students' data collection at the coffee outlets.</p> <p>Award 1 mark for each explanation of each possible issue related to research ethics with regard to the students' collection of data at the coffee outlets, to a maximum of 6 marks.</p> <p>Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <p>Possible responses include:</p> <ul style="list-style-type: none"> • The students did not obtain permission from the management/staff of each outlet to observe and record customer behaviour and transactions within the premises [1 mark]. As such, the coffee outlets may misunderstand the students' intentions of collecting such data, and may not appreciate the students' actions [1 additional mark]. • The students may have inadvertently affected the coffee outlet's business by occupying tables during periods when the coffee outlets are crowded [1 mark]. This is because their actions would have prevented potential customers from getting a seat [1 additional mark]. 	[6]

		<ul style="list-style-type: none"> The students did not seek consent/permission to take photographs of customers within the coffee outlets [1 mark]. Customers may not appreciate being observed or photographed without their permission, and may also misunderstand the students' intentions of collecting such data [1 additional mark]. <p>AO2</p>	
	(c)	<p>With reference to Resources 2A and 2B, suggest how the students can ensure the accuracy and reliability of their data in Resource 3.</p> <p>Award 1 mark for each suggestion of how students can ensure the accuracy and reliability of their data, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each suggestion, where applicable.</p> <p><i>Possible responses include:</i></p> <ul style="list-style-type: none"> Students should have a clear view of the ordering counter, especially in the crowded Coffee Outlet B [1 mark]. This may help to ensure the accuracy of the number of customers being counted [1 additional mark]. Students may wish to collect more data by repeating the data collection again at additional timings during the day (or on additional days during the week) [1 mark]. This can improve the representativeness of the number of customers at the selected site during the day (or during the week), and hence improve the reliability of the data [1 additional mark]. The students may wish to give up their table when there are customers looking to be seated, and observe the ordering counter from an alternative location instead [1 mark]. This is because the students taking up an available table during busy periods may inadvertently 'force' some customers to purchase a takeaway drink (instead of consuming the drink on the premises). This would skew the students' data and reduce its reliability. [1 additional mark] Students may wish to exclude the total number of customers who are purchasing drinks to be consumed on the premises or simply purchasing food, as such customers do not need to use takeaway cups or reusable cups [1 mark]. <p>AO2</p>	[4]
	(d)	<p>Describe the pattern in the percentage of customers using reuseable cups at Coffee Outlets A and B, as shown in Resource 3.</p> <p>Award 1 mark for each description of a pattern in the percentage of customers using reuseable cups at Coffee Outlets A and B, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each description, where applicable.</p> <p><i>Possible responses include:</i></p> <ul style="list-style-type: none"> The highest percentage of customers using reusable cups takes place in the morning from 8.30 – 10 am at both coffee outlets [1 mark]. During this period, 	[4]

	<p>25.8% of customers at Coffee Outlet A and 31.3% of customers at Coffee Outlet B used reusable cups [1 additional mark].</p> <ul style="list-style-type: none"> The percentage of customers using reusable cups at both coffee outlets reduces as the day progresses [1 mark]. For example, while 25.8% of customers at Coffee Outlet A used reusable cups in the morning, this proportion reduces to 19.7% by 12 – 2 pm, and further reduces to 12.3% by 5 – 7 pm [1 additional mark]. There is generally a greater percentage of customers using reusable cups at Coffee Outlet B, from 8.30-10.30 am and 12-2 pm [1 mark]. However, Coffee Outlet A has a slightly higher percentage of customers using reusable cups from 5-7 pm [1 additional mark]. <p>AO2</p>	
(e)	<p>With reference to Resource 4A, explain the limitations of the students' survey form.</p> <p>Award 1 mark for each explanation of a possible limitation in the students' survey form, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <p>Possible responses include:</p> <ul style="list-style-type: none"> The request for respondents' names on the forms may affect the reliability of the responses, since respondents may become more conscious about how their responses may be interpreted [1 mark]. For instance, since respondents know that their responses can be 'traced' back to them, they may refrain from indicating that they do not use reusable cups out of concern that it demonstrates their lack of environmental responsibility/awareness. [1 additional mark]. Instead allowing respondents to respond freely to Question (ii), the provision of prepared/pre-filled options may inadvertently influence the respondents' eventual thoughts and responses [1 mark]. Respondents may select these options out of convenience instead of sharing their real reasons (for using reusable cups), thus affecting the reliability of the students' data [1 additional mark]. The phrases "strong influence" and "some influence" in Questions (iii) and (iv) tend to be ambiguous and subjective [1 mark]. Such phrases may be interpreted differently by different participants, which may affect the reliability of the students' data [1 additional mark]. While the survey is aimed at "working adults", the survey does not ask for the working status of each survey respondent, so it is difficult to ascertain whether all of the survey respondents are considered valid samples [1 mark]. For instance, the students will not be able to know if a particular respondent is currently unemployed or retired [1 additional mark]. There is no collection of certain information (such as age, gender, or frequency of buying drinks from cafes in the CBD) which would have provided the students with greater insight into the consumer behaviour/patterns of the working adults [1 mark]. <p>AO2</p>	[4]

(f)	<p>With reference to Resources 4A and 4B, suggest how the students could improve their sampling method for the online survey.</p> <p>Award 1 mark for each suggestion of how the students could improve their sampling method for the online survey, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each suggestion, where applicable.</p> <p><i>Possible responses include:</i></p> <ul style="list-style-type: none"> • Students can consider increasing the size of the sample to improve the representativeness of their data sample [1 mark]. For instance, instead of limiting their sample size to 30 respondents, the students could invite as many working adults as possible to respond to the online survey within a given time period [1 additional mark]. • Students can ensure that their sample comprise certain types/categories of participants to improve the representativeness of their data sample [1 mark]. For instance, the students could ensure that a certain proportion of respondents from a range of age groups or educational backgrounds [1 additional mark]. • To reduce the possibility of selection bias in the data, students may wish to put up their survey on online media platforms to reach working adults who have little or no direct personal connection to them [1 mark]. This minimises the influence that their personal contacts would have on the profile of the survey respondents. For example, an environmentally-conscious family member may refer the students to another similar environmentally-conscious adult. [1 additional mark] • To reduce the possibility of selection bias in their data, students could make use of a probability sampling method such as simple random sampling, instead of the non-probability convenience sampling method they have currently adopted for their online survey [1 mark]. For instance, students could obtain a list of employees from a company and allocate a number to each employee. Thereafter, they could use a random number generator to select their sample of working adults to answer the survey. [1 additional mark] <p>AO2</p>	[4]
(g)	<p>The students hope to conduct further research into how working adults are motivated by their friends to use reusable cups, as shown in Resource 4B. Explain the advantages of conducting interviews to collect the data.</p> <p>Award 1 mark for each explanation of an advantage in conducting interviews to collect the data, to a maximum of 4 marks.</p> <p>Award a maximum of 1 additional mark for further development of each explanation, where applicable.</p> <p><i>Possible responses include:</i></p> <ul style="list-style-type: none"> • Since the top factor has to do with personal friends (of the participants), one-on-one interviews can provide a safe and confidential setting for participants to discuss potentially sensitive issues or their personal experiences [1 mark]. This can help to 	[4]

		<p>ensure that participants feel comfortable and willing to share their experiences, leading to more accurate and complete data [1 additional mark].</p> <ul style="list-style-type: none"> Interviews can provide students with the opportunity to collect rich and detailed data that captures the complexity and nuances of participants' expressions, experiences, and perspectives [1 mark]. This can provide valuable insight into the ways friends are a critical factor in motivating working adults to use reusable cups [1 additional mark]. Interviews can allow the students to ask follow-up questions or seek clarification when participants' responses are unclear or ambiguous [1 mark]. This can help to ensure that the data collected is accurate and complete, and can lead to a deeper understanding into how friends are a motivating factor [1 mark]. Interviews are flexible and allows the students to ask follow-up questions or explore unexpected topics as they arise, providing a more holistic understanding of how friends are a motivating factor [1 mark]. For instance, conversations with the interviewees may reveal additional insight about how friendships or peer influence may motivate working adults to use reusable cups [1 additional mark]. <p>AO1</p>	
	(h)	<p>The students concluded that an additional charge for takeaway cups will result in higher use of reuseable cups. With reference to Resources 3, 4A, and 4B, evaluate the validity of their conclusion.</p> <p>Possible approaches</p> <p>Candidates could refer to Resource 3 and 4B and consider how far the collected data can support the students' hypothesis. Candidates could also look at the way data was collected via the survey form in Resource 3 and assess if the methods used could compromise the accuracy and reliability of the data. For instance, they could look at whether the sampling method and sample size may be sufficient in providing robust data for their investigation.</p> <p>Additionally, candidates could consider what other data may be needed for this investigation. For instance, the survey design and findings may not capture other possible factors that influence the decision of working adults to use reusable cups. The data collected in Resource 3 suggests that the time of day may also play a role in influencing their decision (besides the imposition of an additional charge). The data indicates that a greater proportion of working adults are more likely to use reusable cups in the morning, as compared to the evening.</p> <p><i>Levels marked using Generic Level Descriptors for H2 fieldwork evaluative questions.</i></p> <p>AO3</p>	[10]

Sources

- **Resource 1:** *Adapted from EduGIS*
- **Resource 2A:** <https://www.travelishcious.com/blog/2019/02/the-little-red-dot/>
- **Resource 2B:** <https://www.misstamchiak.com/chye-seng-huat-hardware/>