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Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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4430324720

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **October/November 2024**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed)
Calculator
Protractor
Ruler

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined pages at the end of this booklet; the question number or numbers must be clearly shown.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [ ].
- The insert contains additional resources referred to in the questions.

LEDCs – Less Economically Developed Countries
MEDCs – More Economically Developed Countries

This document has **20** pages. Any blank pages are indicated.

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1 Students in Vietnam did fieldwork to investigate pollution in local lakes and rivers.

(a) They had seen the results of a survey on a website which asked for people's views about pollution in the city. These results are shown in Fig. 1.1 (Insert).

(i) What type of graph is shown in Fig. 1.1? (Circle) your answer.

pictogram radial graph scatter graph triangular graph [1]

(ii) The results shown in Fig. 1.1 are 'secondary' data. How is 'secondary' data different from 'primary' data?

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..... [2]

(iii) From the results shown in Fig. 1.1, what is the dissatisfaction score for water pollution in the city?

..... [1]

The students investigated variations in water pollution in rivers and small lakes around the city. One student chose the following hypotheses:

Hypothesis 1: *As distance from the city centre increases, the water becomes more visually polluted.*

Hypothesis 2: *The level of water pollution varies as the main land use of the area changes.*

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(b) To investigate **Hypothesis 1:** *As distance from the city centre increases, the water becomes more visually polluted*, the students did a survey to assess the visual pollution at seven sites at increasing distances from the city centre. They used the survey recording sheet shown in Fig. 1.2 (Insert).

(i) Before they used the survey sheet, the students discussed possible problems they may have using it, and how they could make the results more reliable. The following table shows three possible problems suggested by the students.
Suggest **one** different way to solve each problem.

problem	possible solution
The students are unsure about how to use the visual water pollution survey recording sheet.	....
Members of the group have different opinions about what score to give for each category.	....
Conditions in the rivers and lakes vary from day to day.	....

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(ii) The students' decisions at one of the sites are shown in the following table. Use these to **complete the survey recording sheet** on Fig. 1.3. The first two categories have been done for you.

category to assess	description
water clarity	fairly clear
colour of the water	clear and no colour
stones on the bed and sides of the river or lake	lightly covered in brown deposits
weeds growing in the water	a lot throughout the water
grey sewage fungus	a little
scum/froth/oil on the water surface	a few bubbles
rubbish dumped in the water	a few large items

[2]

(iii) **Calculate** the total visual water pollution score at the site shown in Fig. 1.3.

.....

[1]

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Students' visual water pollution survey recording sheet

site number _____

category to assess	score to give				
	0 points	1 point	2 points	3 points	4 points
water clarity	very clear	clear	fairly clear	slightly murky	murky
colour of the water	very clear and no colour	clear and no colour	slightly brown	dark brown	black or grey
stones on the bed and sides of the river or lake	clean and bare	clean	lightly covered in brown deposits	coated with brown deposits	covered in brown and grey deposits
weeds growing in the water	none	a little in shallow water	a lot in shallow water	a lot throughout the water	water is choked with weed
grey sewage fungus	none	very little	a little	present in patches	plenty across the surface
scum/froth/oil on the water surface	none	a few bubbles	noticeable islands of foam	large quantities	covers the whole surface
rubbish dumped in the water	none	a few small items	a few large items	large and small items	many different large items

total score	overall description
0–3	very clean
4–9	clean
10–15	fairly clean
16–21	slightly polluted
more than 21	badly polluted

Fig. 1.3

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(iv) The students calculated the total visual water pollution score at each site. Their scores are shown in Table 1.1 (Insert).
Look again at Fig. 1.2 (Insert). At which site did the students' total score indicate the overall description was 'clean'?

site number ..... [1]

(v) Use the results in Table 1.1 **to plot the total visual water pollution score for site 3** on Fig. 1.4. [1]

Total visual water pollution score at each site

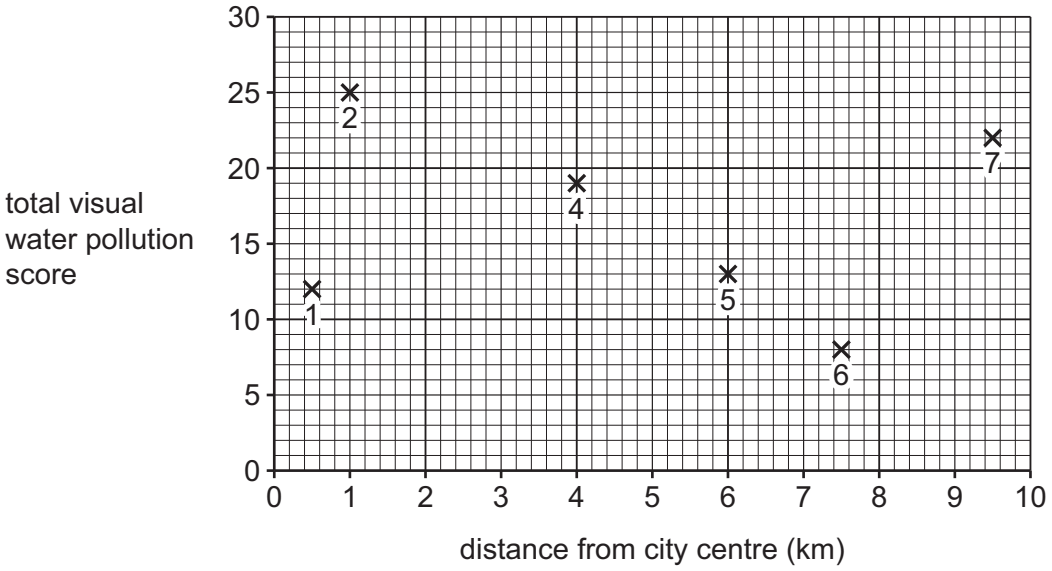

Fig. 1.4

(vi) What conclusion would the students make about **Hypothesis 1:** *As distance from the city centre increases, the water becomes more visually polluted*? Support your answer with evidence from Fig. 1.4 and Table 1.1.

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(c) To investigate **Hypothesis 2:** *The level of water pollution varies as the main land use of the area changes*, the students measured the pH level of the water at each fieldwork site.

pH is a measurement of water acidity. The pH score decreases as water becomes more acidic, which means that pollution is more likely.

The students used a digital meter to measure the pH of the water. The digital meter is shown in Fig. 1.5 (Insert).

(i) Describe their method for measuring the pH of water by putting the following statements into the correct order in the table. **Use the letters A to D to complete your answer.**

letter	statement
A	read the pH measurement on the digital display
B	collect a sample of water from the river
C	put the pH meter probe into the water sample
D	pour the sample of water into a clean container

order	letter
1	
2	
3	
4	

[1]

(ii) Describe **three** ways that the students could make sure that their measurements were reliable.

1 .....

.....

2 .....

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3 .....

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[3]

(iii) Table 1.2 (Insert) shows the results of the students' measurements and the main land uses at each site. Use these results **to plot the pH measurement at site 3** on Fig. 1.6. [1]

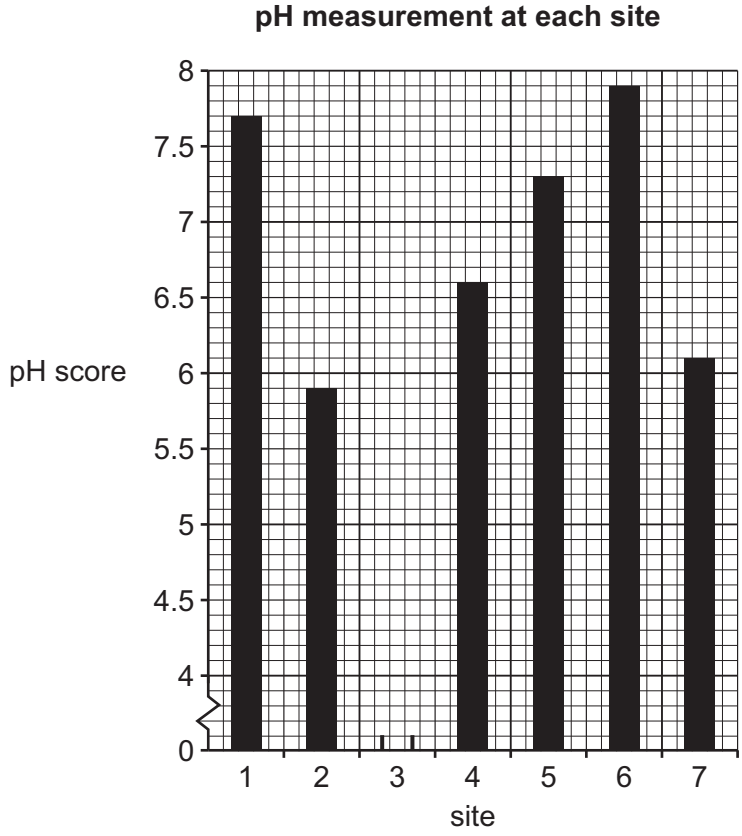

Fig. 1.6

(iv) What is the correct conclusion to **Hypothesis 2:** *The level of water pollution varies as the main land use of the area changes*? Support your decision with evidence from Fig. 1.6 and Table 1.2.

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(d) (i) Suggest a different hypothesis that students could test through **river** fieldwork. Do **not** refer to pollution.

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..... [1]

(ii) Describe how they could test this hypothesis through fieldwork. You may use a labelled diagram in your answer.

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2 Students in Nigeria were studying indicators of development. One indicator is the Human Development Index (HDI).

(a) Which **two** of the following are included in the Human Development Index? Tick (✓) your answers.

	tick (✓)
access to clean drinking water	
average number of years studying at school	
birth rate	
life expectancy	
percentage of population in primary sector of industry	

[2]

The students decided to investigate development indicators in two villages. One student chose infant mortality and literacy as their hypothesis topics.

Hypothesis 1: *The main cause of infant mortality is the lack of health care*.

Hypothesis 2: *Reading is more popular in a village with a library than in a village without a library.*

(b) To investigate their hypotheses the students used a questionnaire.

(i) The students gave the questionnaire to 20 people in a pilot study. Suggest **two** reasons why they did a pilot study.

1 .....

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2 .....

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[2]

(ii) In the pilot study, the students gave the questionnaire to people and asked them to return it to the students when they had completed it. What are the weaknesses of this method of research?

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(c) For their main study, the students decided to complete the questionnaire by asking people directly. They sampled 100 people in each village.
They could use a random, systematic or stratified method of sampling.
Choose **one** sampling method. Describe the method and explain why it would be a good method to use.

sampling method: .....

.....

.....

.....

.....

.....

..... [3]

(d) Part of the questionnaire the student used to investigate **Hypothesis 1:** *The main cause of infant mortality is the lack of health care*, is shown in Fig. 2.1 (Insert).
The results of the infant mortality question are shown in Table 2.1 (Insert).

(i) **Complete the divided bar** for 'overcrowded living conditions' on Fig. 2.2. [3]

(ii) What conclusion would the student make about **Hypothesis 1:** *The main cause of infant mortality is the lack of health care*? What evidence in Fig. 2.2 and Table 2.1 supports their conclusion?

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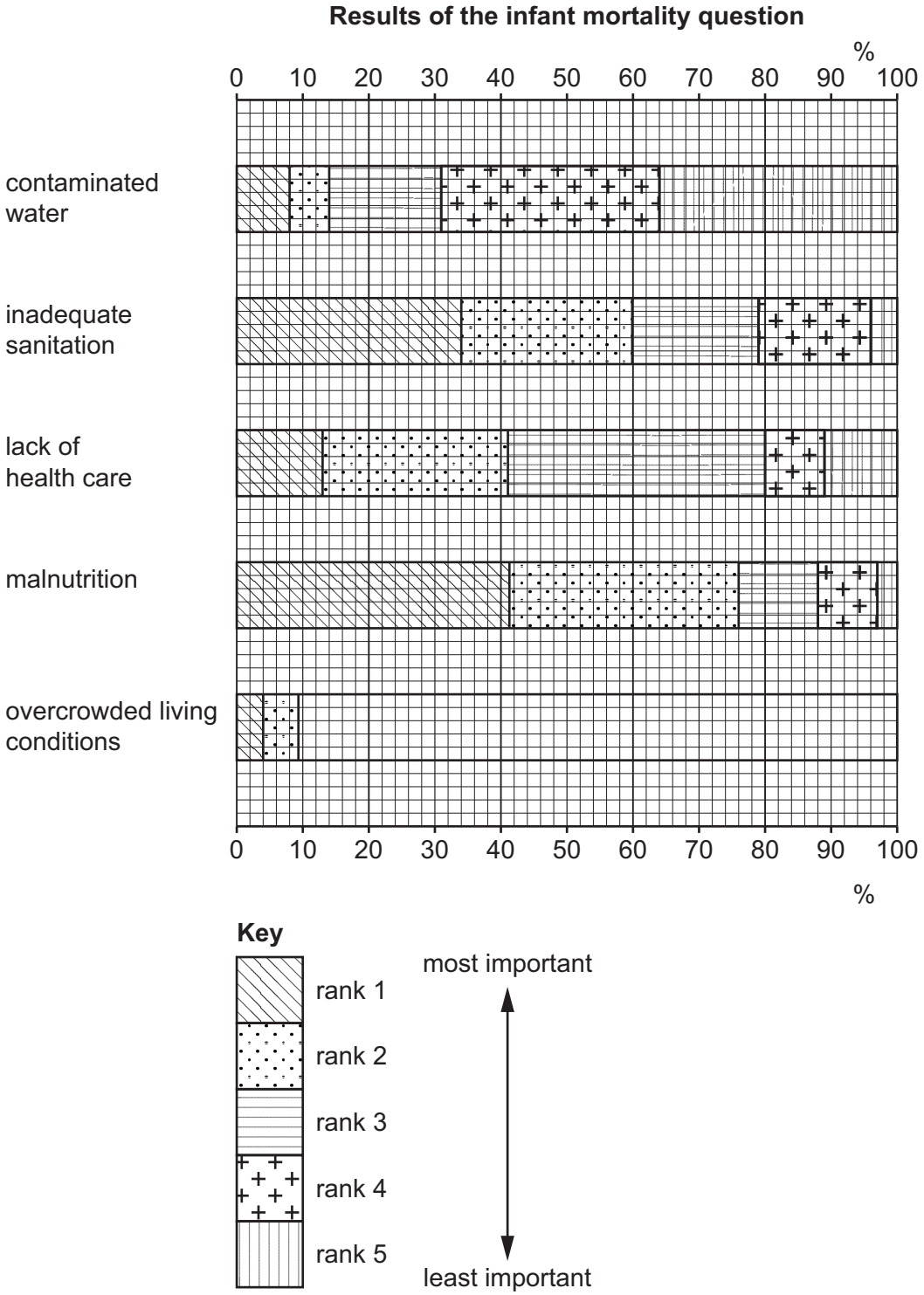

Fig. 2.2

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(e) To investigate **Hypothesis 2:** *Reading is more popular in a village with a library than in a village without a library,* the student used the second part of the questionnaire. The questionnaire is shown in Fig. 2.3 (Insert). There was a library in one village but no library in the other village.

(i) The results of question 1 'How often do you read a book?' are shown in Table 2.2 (Insert). Use the results to **complete the pie graph** for the village without a library on Fig. 2.4. [2]

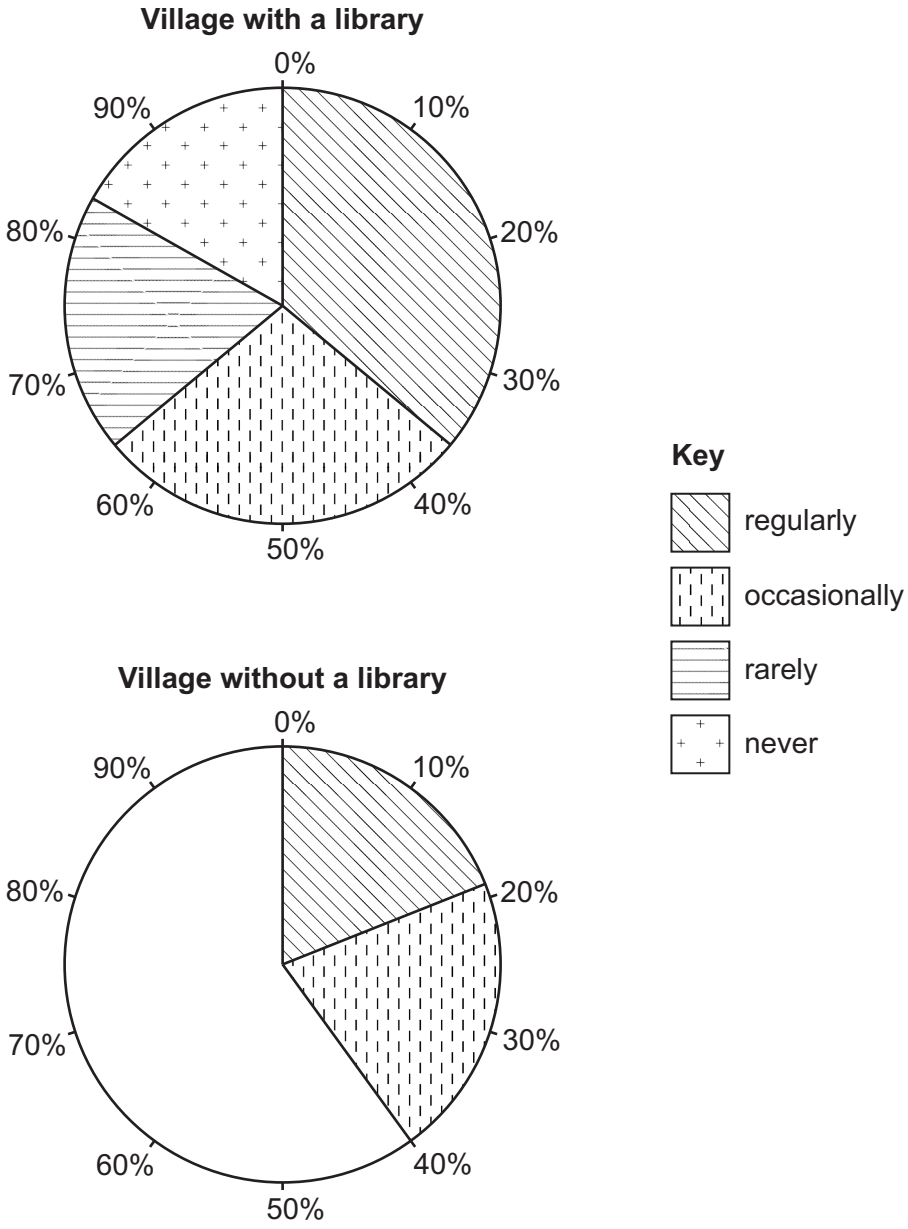

Fig. 2.4

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(ii) The answers to question 2 'What most affects how often you read books?' are shown in Table 2.3 (Insert). **Draw the bar** to show 'I have time to read' for the village with a library on Fig. 2.5. [1]

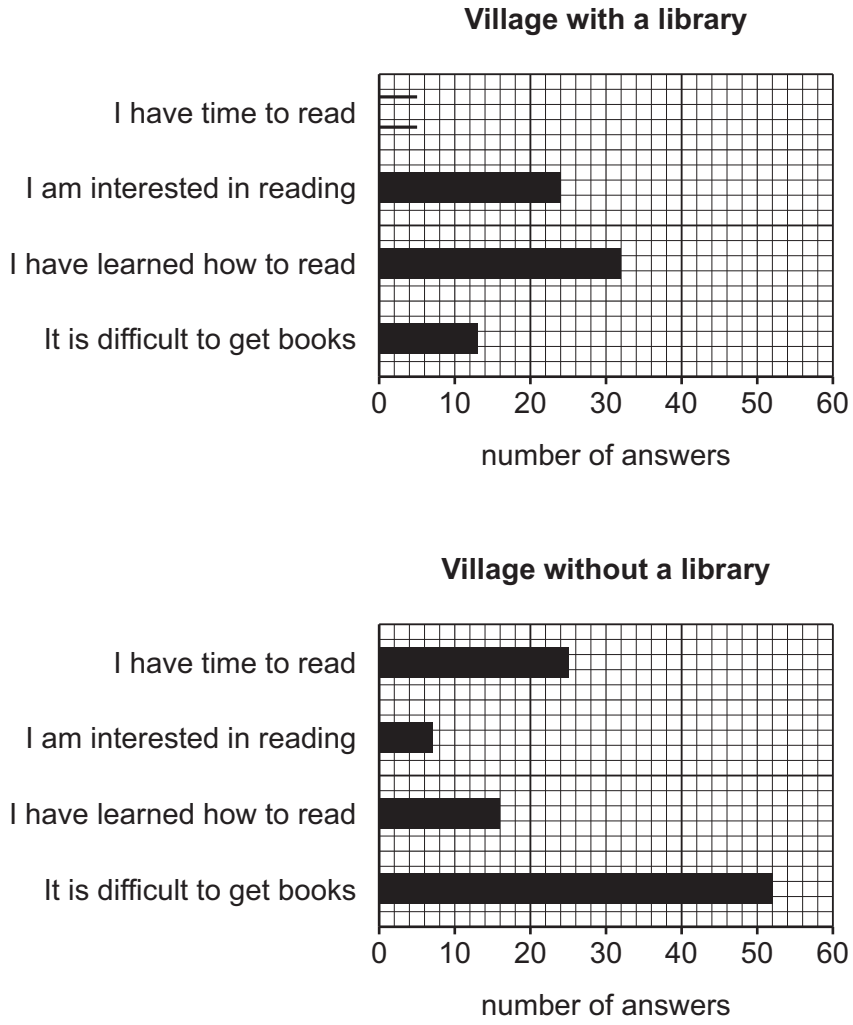

Fig. 2.5

(iii) What is the correct conclusion to **Hypothesis 2:** *Reading is more popular in a village with a library than in a village without a library*? Support your decision with evidence from Figs. 2.4 and 2.5, and Tables 2.2 and 2.3.

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(f) Explain what factors, other than access to a library, could affect the level of literacy in a country.

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(g) The students wanted to extend their study by investigating how shops and services differed between the two villages. Describe how they could collect information about shops and services. Do **not** include a questionnaire in your answer.

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