Cambridge Assessment International Education

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3450631215

GEOGRAPHY **0460/42**

Paper 4 Alternative to Coursework **May/June 2024**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed) Ruler
Calculator
Protractor

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.

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

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

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1 Students from Ecuador who live near the Cotopaxi volcano did some fieldwork to study changes in vegetation cover and the infiltration rate. They visited three sites going up the lower slope of the volcano.

(a) Before they began their fieldwork, the students assessed some hazards they may come across and how to manage them. Their decisions are shown in Table 1.1 (Insert).

(i) Which **one** of the hazards did the students think would have the greatest risk?

..... [1]

(ii) Suggest **different** ways to reduce the risk from each of the following hazards during fieldwork:

hypothermia from getting cold and wet

.....

.....

uneven ground and slippery rocks

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.....

getting lost or separated from others.

.....

.....

[3]

The students investigated the following hypotheses by doing fieldwork at three sites.

Hypothesis 1: *Vegetation cover decreases as altitude (height above sea level) increases.*

Hypothesis 2: *The rate of infiltration increases as altitude increases.*

(b) To measure the amount of vegetation cover, the students used the piece of equipment shown in Fig. 1.1 (Insert).

(i) What is this piece of equipment called? Tick (✓) your answer.

	tick (✓)
anemometer	
callipers	
clinometer	
quadrat	
ruler	

[1]

(ii) Describe how students would use the equipment shown in Fig. 1.1 to measure the amount of vegetation cover.

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..... [3]

(iii) The students' fieldwork results are shown in Table 1.2 (Insert). At each site they made two measurements. Suggest why the results of the two measurements of bare soil at site **B** are so different.

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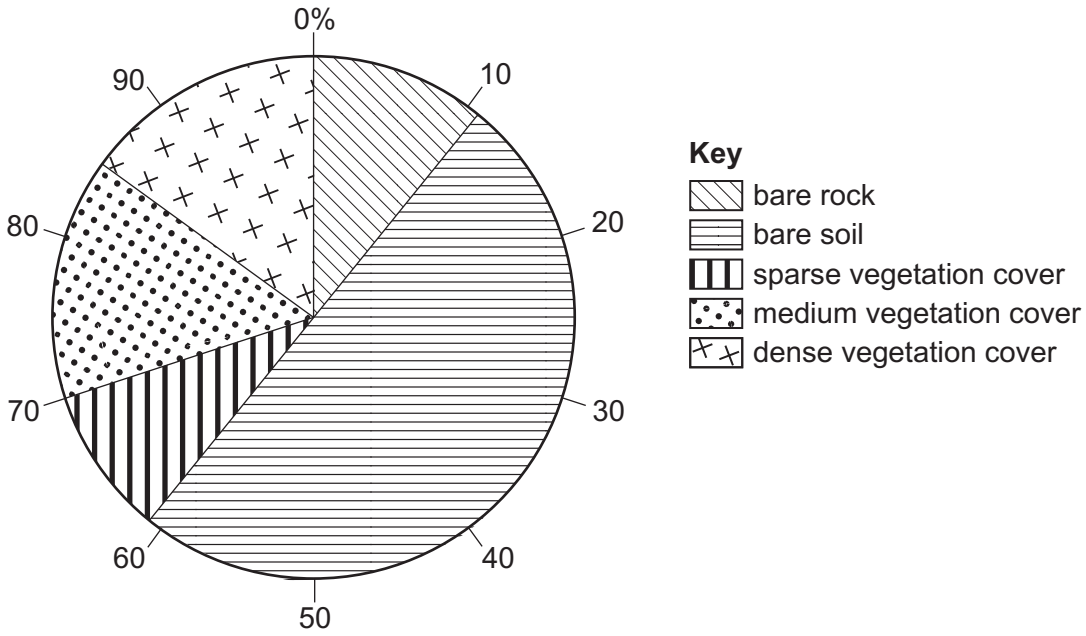
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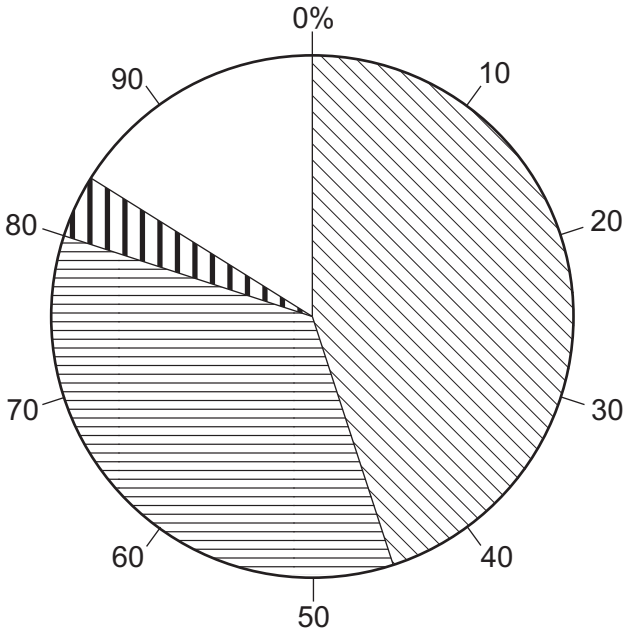
(iv) Use the results to **complete the pie graph** for the average measurements at site **B** in Fig. 1.2. [2]

Average vegetation cover at the three fieldwork sites

site **A** at 3700 m above sea level



site **B** at 3780 m above sea level



site **C** at 3850 m above sea level

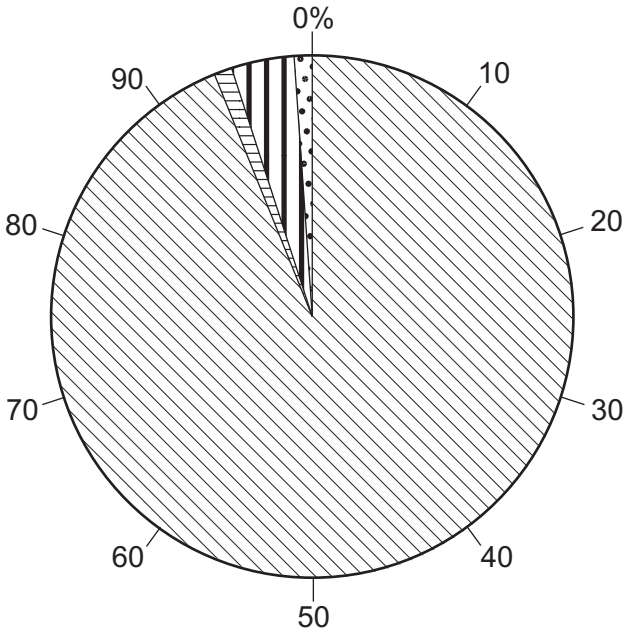


Fig. 1.2

(v) Do the students' results support **Hypothesis 1**: *Vegetation cover decreases as altitude (height above sea level) increases*? Support your decision with evidence from Fig. 1.2 and Table 1.2.

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..... [4]

(c) Fig. 1.3 (Insert) shows the method used to measure the rate of infiltration.

(i) Define *infiltration*.

.....

..... [1]

(ii) What did the students use the following equipment for?

plastic pipe

.....

.....

ruler

.....

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stopwatch

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[3]

(iii) The students measured infiltration twice at each site. Their results are shown in Table 1.3 (Insert). At which site, A, B or C, is there evidence of a measurement which may be unreliable? (Circle) your choice.

site A site B site C [1]

(iv) How do the results suggest that there is an unreliable measurement at this site?

.....

..... [1]

(v) One student plotted their average results on a bar graph. **Draw a bar** to show the average fall in water level at site B on Fig. 1.4. [1]

Student's measurements of infiltration rate

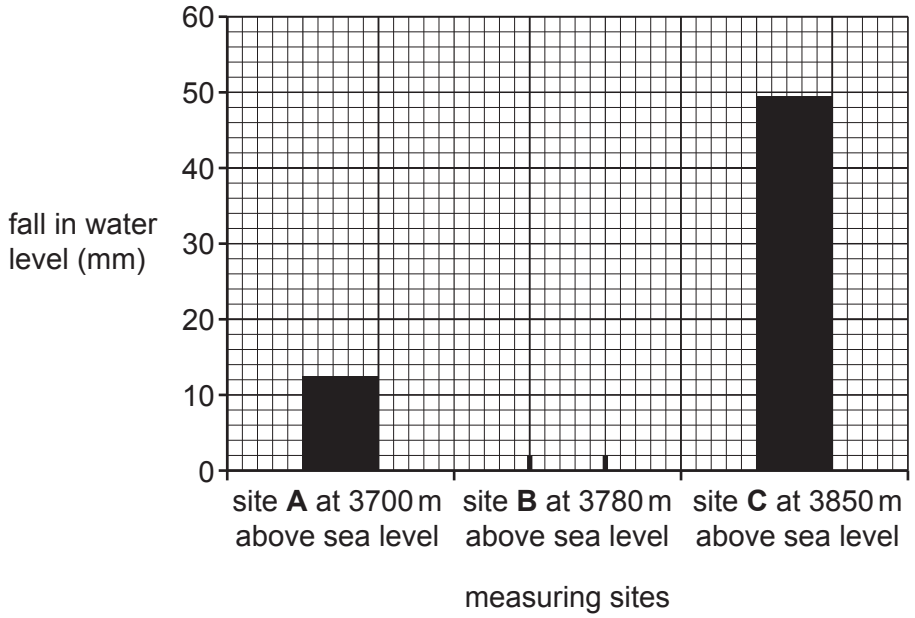


Fig. 1.4

(vi) The students made the conclusion that their results **agreed** with **Hypothesis 2**: *The rate of infiltration increases as altitude increases*. What evidence in Fig. 1.4 and Table 1.3 supports their decision?

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..... [2]

(vii) Suggest **two** reasons why the rate of infiltration varies between the three sites.

1 .....

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2 .....

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[2]

(d) When the students returned to school, they evaluated their fieldwork methods.

Table 1.4 shows three weaknesses in methodology. For each weakness suggest a **different** way to improve the method.

Table 1.4

weakness	improvement
The fieldwork sites were chosen at random.	....
The estimates of vegetation cover were subjective.	....
The measurement of infiltration was unreliable.	....

[3]

[Total: 30]

2 Students in the city of Hong Kong did fieldwork to compare different residential areas. Hong Kong is divided into three residential areas by height above sea level. 'The Peak' is the highest area in Hong Kong. Lower down is the area of 'Mid-Levels'. On the lowest land surrounding the CBD is 'Central'. The areas are shown in Fig. 2.1 (Insert). The students chose sites in each area to do their fieldwork tasks.

One group of students investigated the following hypotheses:

Hypothesis 1: *The quality of the residential environment improves from The Peak through Mid-Levels to Central.*

Hypothesis 2: *The amount of traffic increases towards the CBD of the city.*

(a) In order to investigate **Hypothesis 1**, the students did an environmental quality survey in each residential area. Their recording sheet is shown in Fig. 2.2 (Insert).

(i) Describe how the students would use the recording sheet to do their fieldwork task.

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..... [3]

(ii) Suggest **two** ways that the students could have organised their fieldwork to make sure that their results were reliable.

Give a reason for each way you suggest.

suggestion 1 .....

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reason .....

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suggestion 2 .....

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reason .....

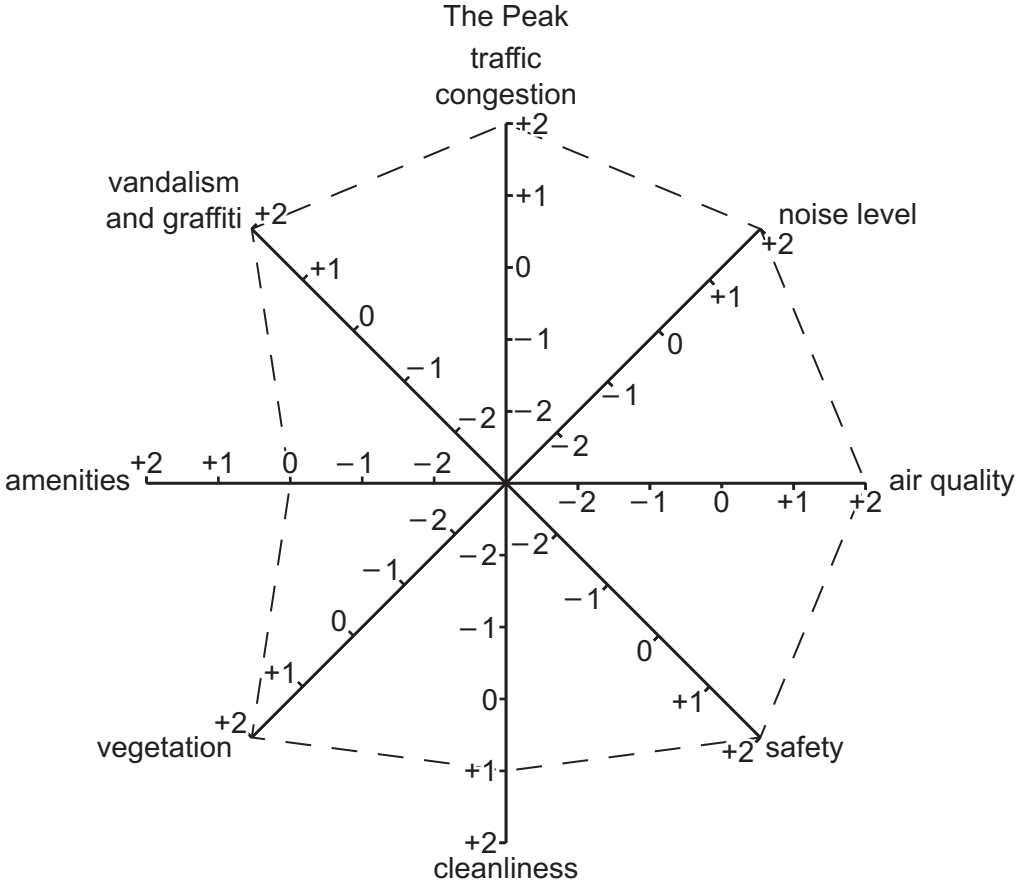
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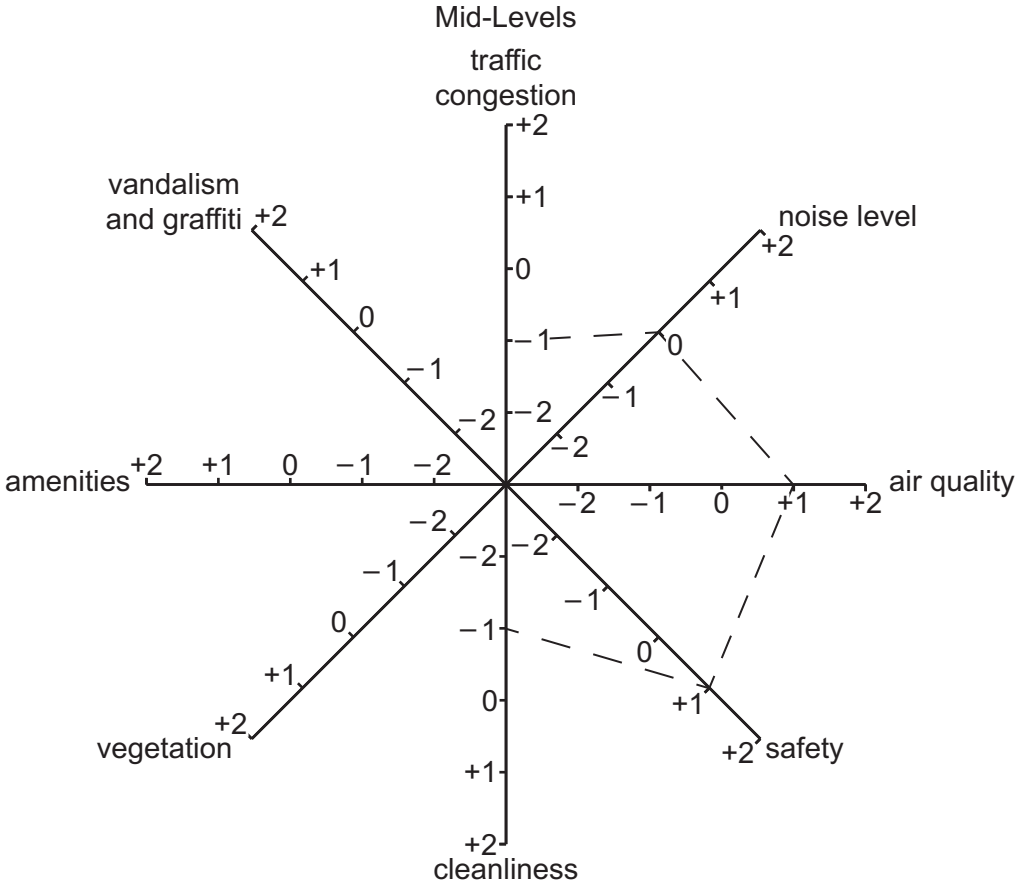
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(iii) The results of the students' survey are shown in Table 2.1 (Insert). One student plotted their results on the graphs shown in Fig. 2.3.
Use the results in Table 2.1 to **complete the graph** for Mid-Levels. [2]

Results of environmental quality survey





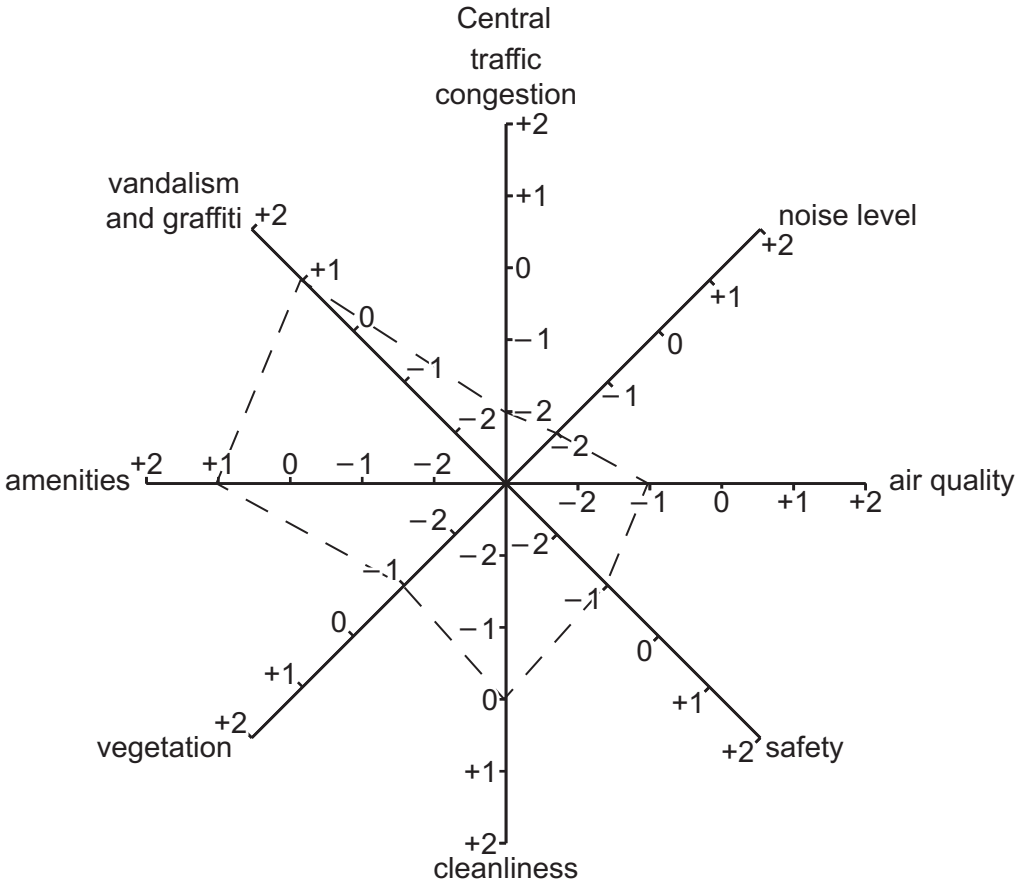


Fig. 2.3

(iv) What conclusion would the students make about **Hypothesis 1**: *The quality of the residential environment improves from The Peak through Mid-Levels to Central*? Use evidence from Fig. 2.3 and Table 2.1 to support your answer.

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..... [3]

(b) To extend this fieldwork, one student used a decibel meter app on their mobile (cell) phone to record the noise levels in different residential areas. The results of this task are shown in Table 2.2 (Insert).

Describe the pattern of results shown in Table 2.2. Do **not** use statistics in your answer.

.....

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..... [2]

(c) To investigate **Hypothesis 2**: *The amount of traffic increases towards the CBD of the city*, the students did a traffic count at sites in the three residential areas.

(i) Which **three** of the following are important features of a traffic count? Tick (✓) your choices.

feature	tick (✓)
Traffic must be counted moving past in both directions.	
Counting must start and finish at the same time at all counting sites.	
Students should work by themselves, so they are not distracted by others.	
The speed of each vehicle can be recorded using a stopwatch.	
A tally method can count and record vehicles in groups of five.	
Identify every fifth vehicle which passes the counting site by make and model of vehicle.	

[3]

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(ii) The results of the traffic count are shown in Table 2.3 (Insert). **Plot the number of vehicles** counted at site 10 on Fig. 2.4. [1]

Results of traffic count

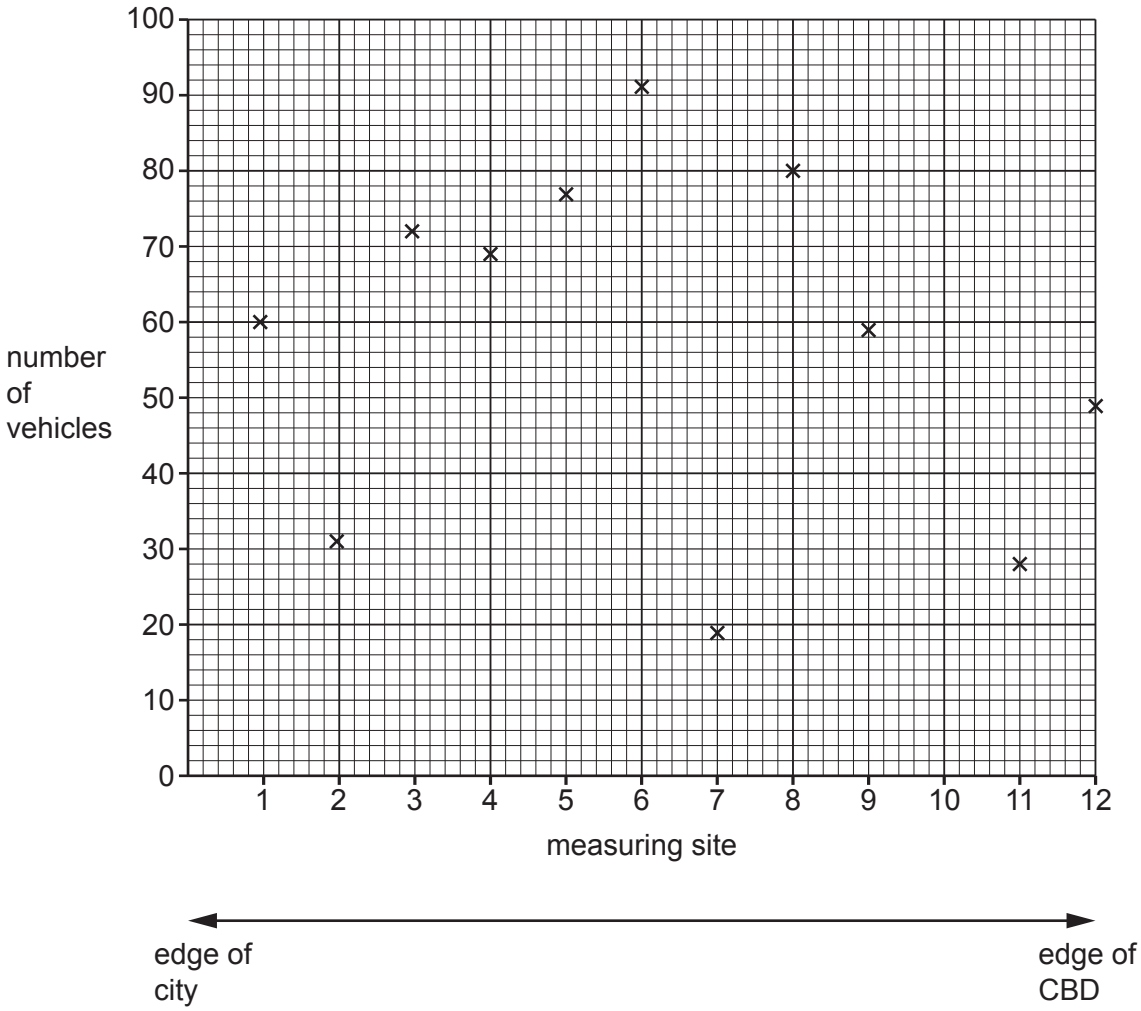


Fig. 2.4

(iii) What was the students' conclusion to **Hypothesis 2**: *The amount of traffic increases towards the CBD of the city*? Support your decision with evidence from Fig. 2.4 and Table 2.3.

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..... [4]

(d) A student extended this fieldwork task by investigating the different types of vehicles counted at three sites. Their results are shown in Table 2.4 (Insert).

(i) Use the results to **complete the graph** for site 5 in Fig. 2.5. [2]

Types of vehicles at three sites

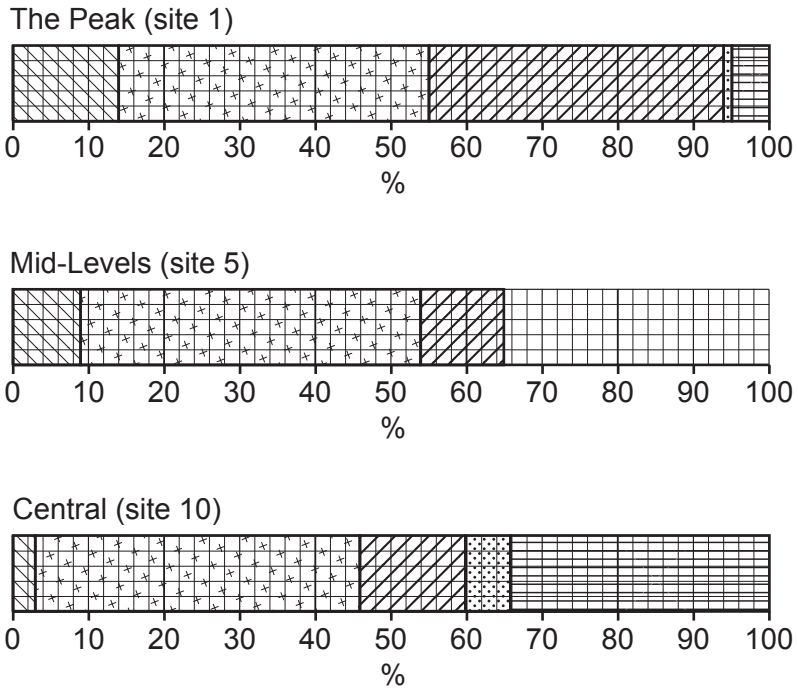


Fig. 2.5

(ii) Describe **two** differences between the percentage of vehicles recorded at sites 1 and 10.

1 .....

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2 .....

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[2]

(e) To extend their fieldwork the students wanted to investigate how the height of buildings varied between different residential areas of the city. Describe a fieldwork method they could use for their investigation.

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[Total: 30]

Additional pages

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