GradeMax

Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

3015555304

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2018**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler
Calculator

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Write your answer to each question in the space provided.
If additional space is required, you should use the lined pages at the end of this booklet. The question number(s) must be clearly shown.

Answer **all** questions.

The Insert contains Figs. 1.1 and 1.6 and Table 1.1 for Question 1, and Figs. 2.1, 2.4 and 2.8 and Tables 2.2 and 2.3 for Question 2.

The Insert is **not** required by the Examiner.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages, **2** blank pages and **1** Insert.

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CAMBRIDGE International Examinations

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1 Students at a college in southern England were studying how to collect weather data and if there might be relationships between weather data measurements. One group of students focused their study on rainfall. They investigated the following hypotheses:

Hypothesis 1: *Daily rainfall totals are influenced by the direction from which the wind is blowing.*

Hypothesis 2: *Daily rainfall totals are higher when atmospheric pressure is higher.*

(a) The students decided to collect their data at 09:00 on each day in February.

Why is it important to collect data at the same time each day?

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.....[1]

(b) The students used a rain gauge and measuring cylinder to collect rainfall data. These are shown in Fig. 1.1 (Insert).

(i) Describe how this equipment is used to measure daily rainfall.

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.....[4]

(ii) Which **two** of the following factors are important when deciding where to put the rain gauge? Tick (✓) your choices below.

Factor	Tick (✓)
away from trees to reduce interception by leaves	
on concrete to collect any rain splashing up from the ground	
on a hillside which is facing the direction the wind is blowing the rain	
next to a main road so it is easy to get to the rain gauge	
remote from people or animals which may interfere with the rain gauge	

[2]

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(c) The students used a wind vane to collect data about wind direction.

(i) On Fig. 1.2 below, **complete the boxes** to show how the wind vane measures wind direction. [2]

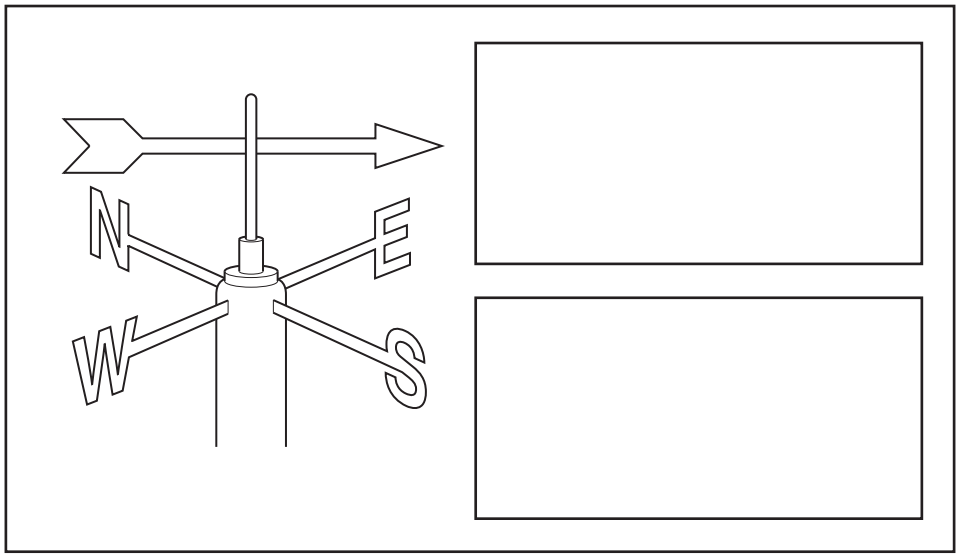


Fig. 1.2

(ii) Suggest a good position to put a wind vane and explain your choice.

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.....[2]

(d) The students used their daily measurements of rainfall and wind direction to plot data onto Fig. 1.3 on page 4.

(i) On Fig. 1.3 **plot the rainfall measurements** for 4th and 27th February shown below.

Date in February	Wind direction	Total rainfall (mm)
4th	south	7.0
27th	north	4.4

[2]

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4

Results of students' measurements of wind direction and total daily rainfall from the current year

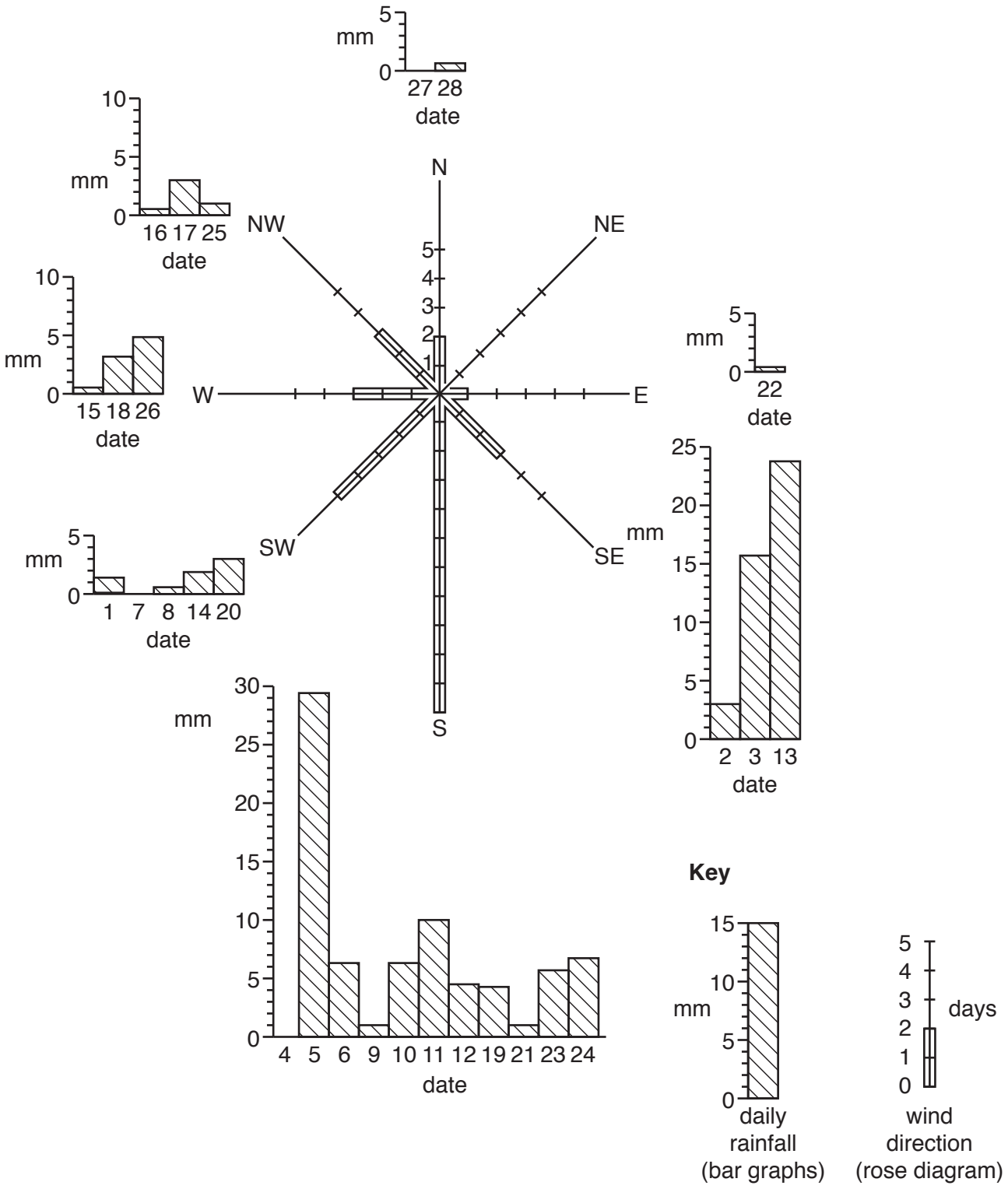


Fig. 1.3

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(ii) What conclusion would the students make about **Hypothesis 1:** *Daily rainfall totals are influenced by the direction from which the wind is blowing*? Support your answer with evidence from Fig. 1.3.

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.....[4]

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The students compared their results with data collected in February of the previous year. This is shown in Fig. 1.4 below.

Wind direction and total daily rainfall data from previous year

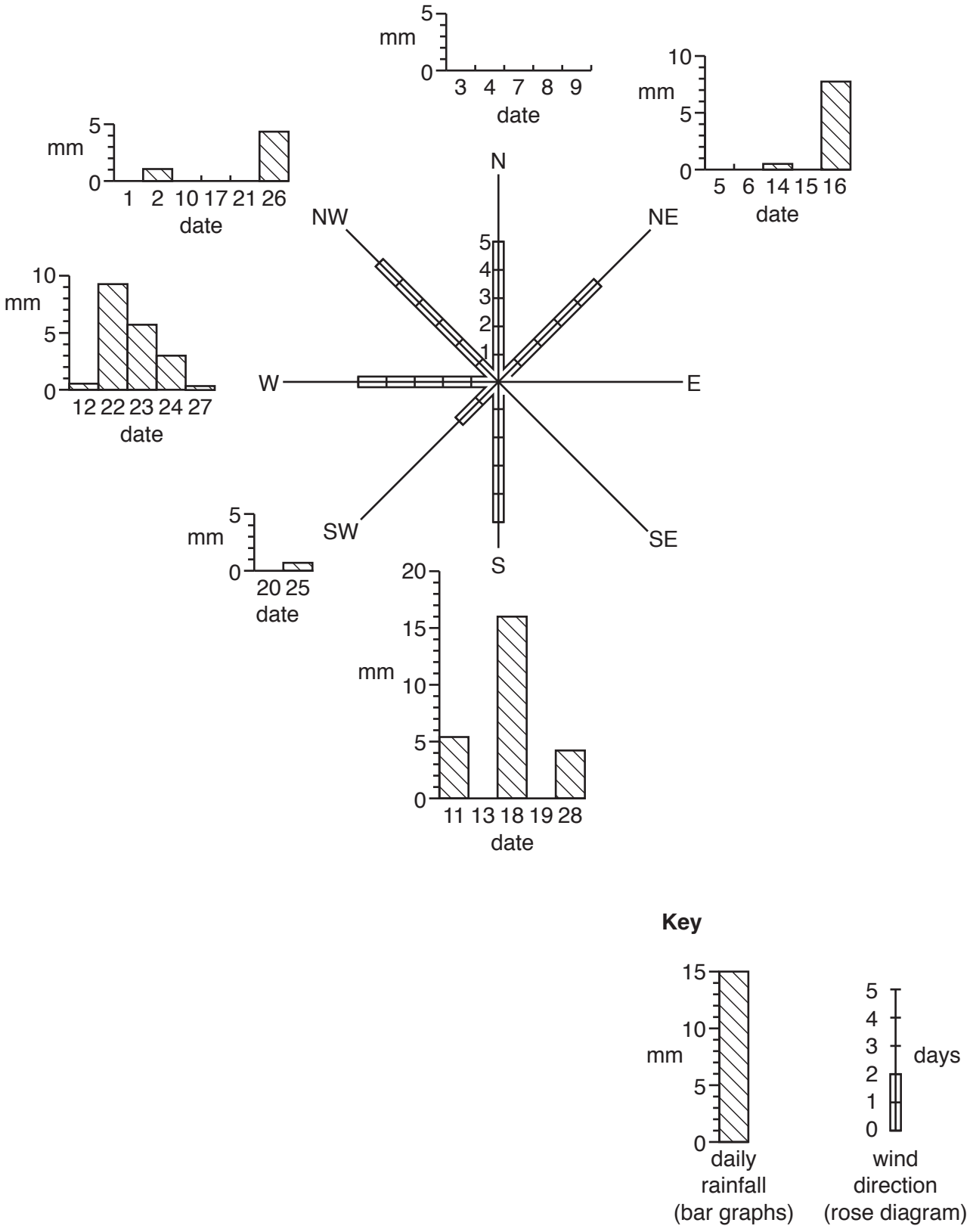


Fig. 1.4

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(iii) Describe how **wind direction** in February varied between the two years shown in Figs. 1.3 and 1.4. Use data in your answer.

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.....[2]

(iv) What effect did the difference in wind direction have on daily amounts of rainfall in February in the two years?

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.....[1]

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(e) To investigate **Hypothesis 2:** *Daily rainfall totals are higher when atmospheric pressure is higher*, the students recorded atmospheric pressure daily.

(i) Which **one** of the following instruments would the students have used to measure atmospheric pressure? Tick (✓) your choice below.

Weather instrument	Tick (✓)
anemometer	
barometer	
hygrometer	
thermometer	

[1]

(ii) The students plotted their measurements of atmospheric pressure and daily rainfall on the scatter graph, Fig. 1.5 below.

Plot the data for the two days in the table below onto Fig. 1.5.

Date in February	Atmospheric pressure (mb)	Total rainfall (mm)
11th	987	10.0
24th	997	3.1

[2]

Atmospheric pressure and daily rainfall totals

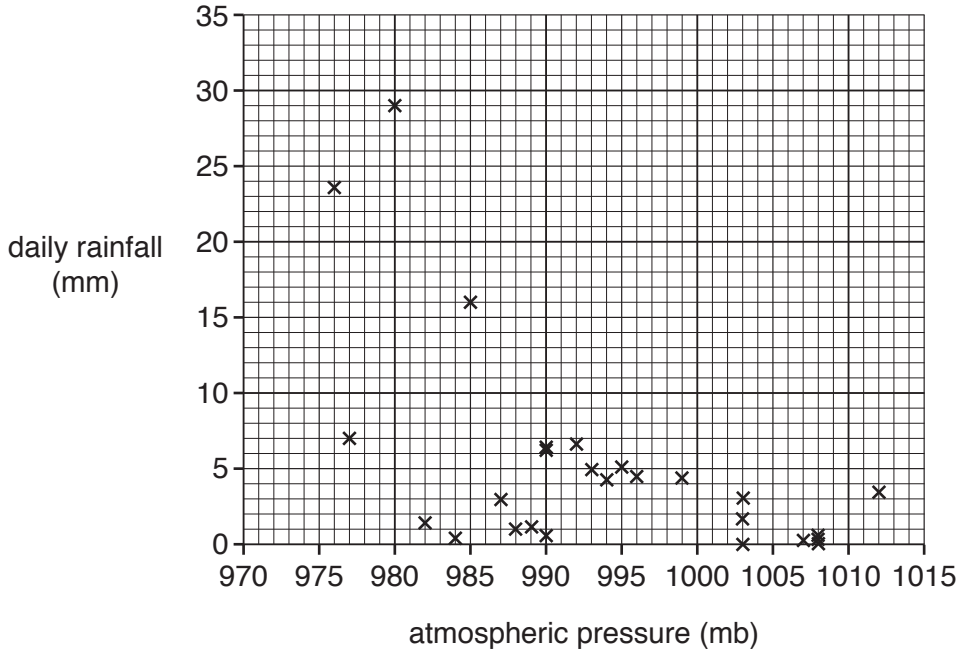


Fig. 1.5

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(iii) The students made the conclusion that **Hypothesis 2:** *Daily rainfall totals are higher when atmospheric pressure is higher* is incorrect. How does Fig. 1.5 support this conclusion? Refer to data in your answer.

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.....[2]

(iv) The students again compared their results with data collected in February of the previous year. Atmospheric pressure data for both months is shown in Table 1.1 (Insert). Describe the differences in atmospheric pressure between the two months. Use data in your answer.

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.....[2]

(f) Another group of students compared data they had collected on average daily temperatures and wind direction. This is shown in Fig. 1.6 (Insert). Describe how the direction from which the wind was blowing affected average daily temperatures.

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.....[3]

[Total: 30]

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2 Students in Thailand did fieldwork to investigate the effects of urban sprawl taking place around their school.

(a) What is meant by *urban sprawl*?

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.....[2]

One group of students measured variations in water pollution in local lakes, and did an environmental quality survey in areas near the school.
They concentrated their investigation on the following hypotheses:

Hypothesis 1: *Lakes are more polluted in areas where housing has been there longer.*

Hypothesis 2: *The overall quality of the environment is better in the older housing area.*

The students selected three sites in different areas around their school to do their fieldwork. They are described in Table 2.1 below.

Table 2.1

Site 1	an area of older, more expensive housing on a secure estate
Site 2	an area of modern, cheaper housing alongside a main road
Site 3	an area where new housing was being completed

(b) To investigate **Hypothesis 1** the students did two tests to measure the pH value and clarity of the water. These two tests are described in Fig. 2.1 (Insert), which is taken from a student's fieldwork notebook.

Suggest why the method to measure pH may be more reliable than the method to measure clarity.

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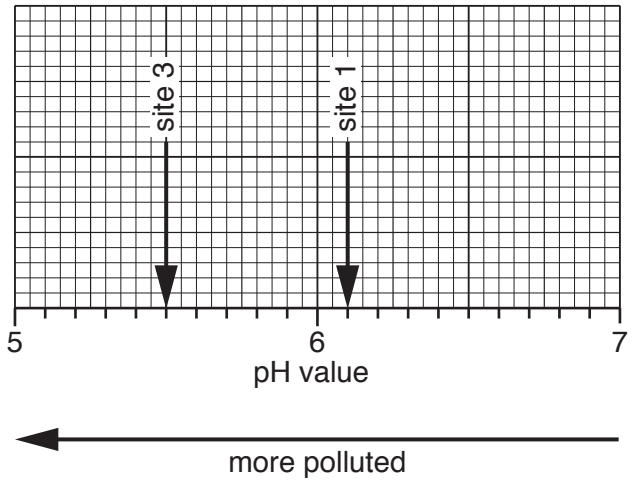
.....[2]

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(c) The results of the tests are shown in Tables 2.2 and 2.3 (Insert).

(i) **Plot the average pH value** of the water at site 2 on Fig. 2.2 below. [1]

Average pH values of water at the three sites



site 1: older housing

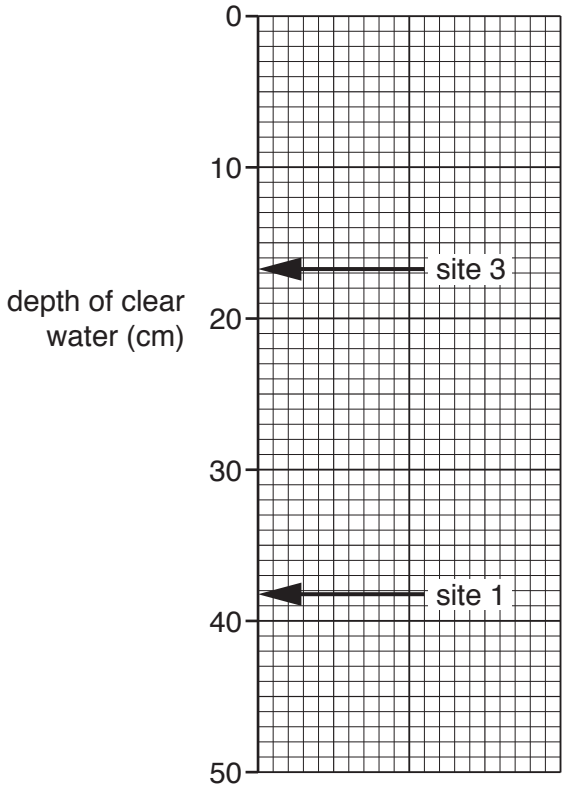
site 2: modern housing

site 3: new housing being completed

Fig. 2.2

(ii) **Plot the average depth of clear water** at site 2 on Fig. 2.3 below. [1]

Average depth of clear water at the three sites



site 1: older housing

site 2: modern housing

site 3: new housing being completed

Fig. 2.3

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(iii) What conclusion would the students make about **Hypothesis 1:** *Lakes are more polluted in areas where housing has been there longer*?
Circle your decision below and support it with evidence from Figs. 2.2 and 2.3 and Tables 2.2 and 2.3.

Hypothesis is true Hypothesis is partly true Hypothesis is false

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.....[4]

(iv) Look again at Table 2.1. Suggest reasons to explain why the level of water pollution varies between the three sites.

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.....[2]

(d) To investigate **Hypothesis 2:** *The overall quality of the environment is better in the older housing area*, the students did an environmental quality survey at each site. Their survey sheet is shown in Fig. 2.4 (Insert).

(i) The decisions made by two students about buildings at the same site are shown in Fig. 2.5 below and opposite.

Students' decisions on environmental quality

Student A

Site number surveyed: 2

	Positive description	**+2**	**+1**	**0**	**–1**	**–2**	**Negative description**
Buildings	in good condition	✓					in poor condition
	well-designed / attractive				✓		poorly designed / ugly
	well maintained		✓				poorly maintained
	no vandalism or graffiti		✓				extensive vandalism or graffiti

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Student B

Site number surveyed: 2

	Positive description	**+2**	**+1**	**0**	**–1**	**–2**	**Negative description**
Buildings	in good condition		✓				in poor condition
	well-designed / attractive			✓			poorly designed / ugly
	well maintained			✓			poorly maintained
	no vandalism or graffiti	✓					extensive vandalism or graffiti

Fig. 2.5

Suggest **two** reasons why the decisions made by the two students are different.

1 .....

.....

2 .....

.....

[2]

(ii) Suggest **two** ways the group of students could have organised themselves to make sure that their results were reliable.
Give a different reason for each way you suggest.

Suggestion 1 .....

Reason .....

.....

Suggestion 2 .....

Reason .....

.....

[4]

(iii) Fig. 2.7 (on page 15) shows the results of the environmental quality survey at the three sites. Use the information in Fig. 2.6 below to **plot the results** for general features at site 2 on Fig. 2.7.

[2]

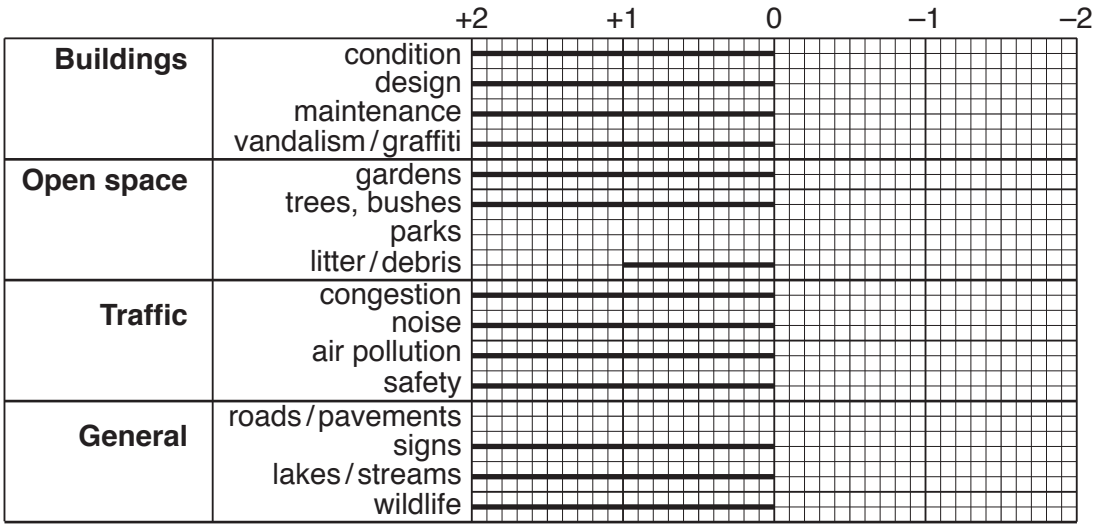
	Positive description	**+2**	**+1**	**0**	**–1**	**–2**	**Negative description**
General	roads and pavements are well maintained			✓			roads and pavements are poorly maintained
	few road signs or advertising boards					✓	lots of road signs and advertising boards
	lakes and streams are clean				✓		lakes and streams are dirty
	lots of insects and wildlife can be seen				✓		no evidence of insects and wildlife

Fig. 2.6

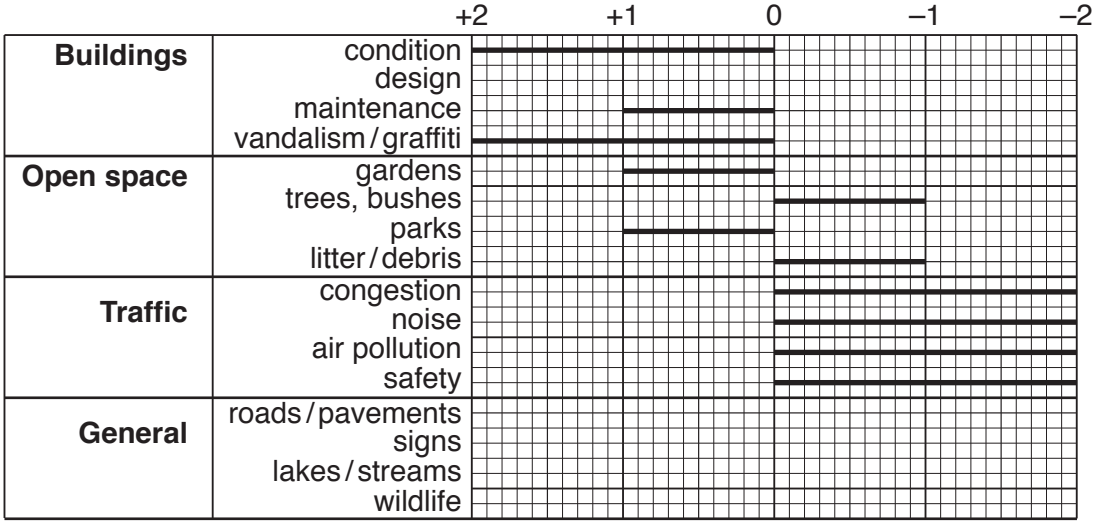
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Results of the environmental quality survey

Site 1: area of older housing



Site 2: area of modern housing



Site 3: area of new housing being completed

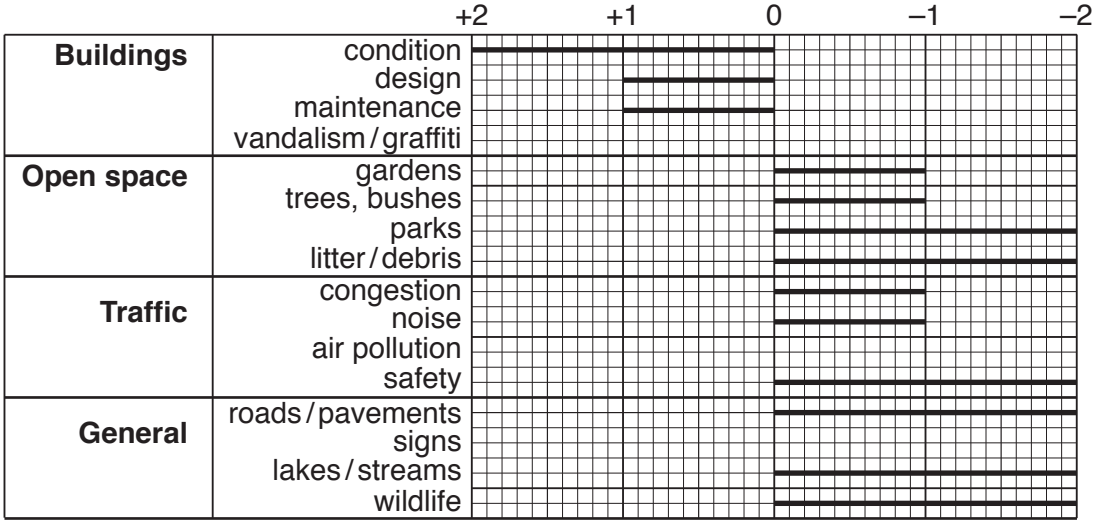


Fig. 2.7

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(iv) Fig. 2.7 shows that the score for condition of the buildings was the same at sites 1 and 2. Identify **one** other description of the buildings which also had the same score at sites 1 and 2.

.....[1]

(v) Use data from Fig. 2.7 to calculate the difference in the total score for the **Open space** category between Sites 1 and 3.

.....[1]

(vi) What conclusion would the students make about **Hypothesis 2:** *The overall quality of the environment is better in the older housing area*? Support your decision with evidence from Fig. 2.7.

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.....[4]

(e) The students did the same environmental quality survey at another local site which had not been developed and was still covered by trees and bushes. Their completed survey sheet is shown in Fig. 2.8 (Insert).
Suggest reasons for the positive scores given by the students for this site on Fig. 2.8.

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.....[4]

[Total: 30]

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Additional Pages

If you use the following lined pages to complete the answer(s) to any question(s), the question number(s) must be clearly shown.

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