GradeMax

Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

9633830369

GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **May/June 2020**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed) Ruler
Calculator

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.

This document has **16** pages. Blank pages are indicated.

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1 Students in Northern Ireland were studying the topic of weather and how to measure and collect weather data. Their school had a variety of instruments to measure elements of weather, including traditional instruments and digital equipment linked to the school's computer network.

(a) (i) Fig. 1.1 (Insert) is a diagram of a traditional weather station. What are the pieces of equipment labelled **A** and **B**?

A .....

B ..... [2]

(ii) Describe **three** features of equipment **A** and explain why each feature is important.

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2 .....

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..... [6]

The students noticed that the weather was forecast to change over the next three days, so they decided to take some measurements to investigate these changes.

One pair of students decided to test the following hypotheses:

Hypothesis 1: *As atmospheric pressure changes rainfall amounts will vary.*

Hypothesis 2: *Atmospheric pressure affects the direction from which the wind blows.*

The two students measured atmospheric pressure, rainfall and which direction the wind was blowing from. They took measurements every three hours using a combination of traditional and digital instruments.

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(b) (i) Which **one** of the following instruments is used to measure atmospheric pressure? Tick (✓) your answer in the box below. [1]

	Tick (✓)
anemometer	
barometer	
hygrometer	
thermometer	

(ii) A rain gauge is shown in Fig. 1.1 (Insert). Explain how it is used to measure rainfall.

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(iii) Explain how a wind vane, which is also shown in Fig. 1.1 (Insert), is used to show the direction from which the wind is blowing.

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(c) The students' results are shown in Table 1.1 (Insert). Use information from the table to complete the following tasks in Fig. 1.2 below.

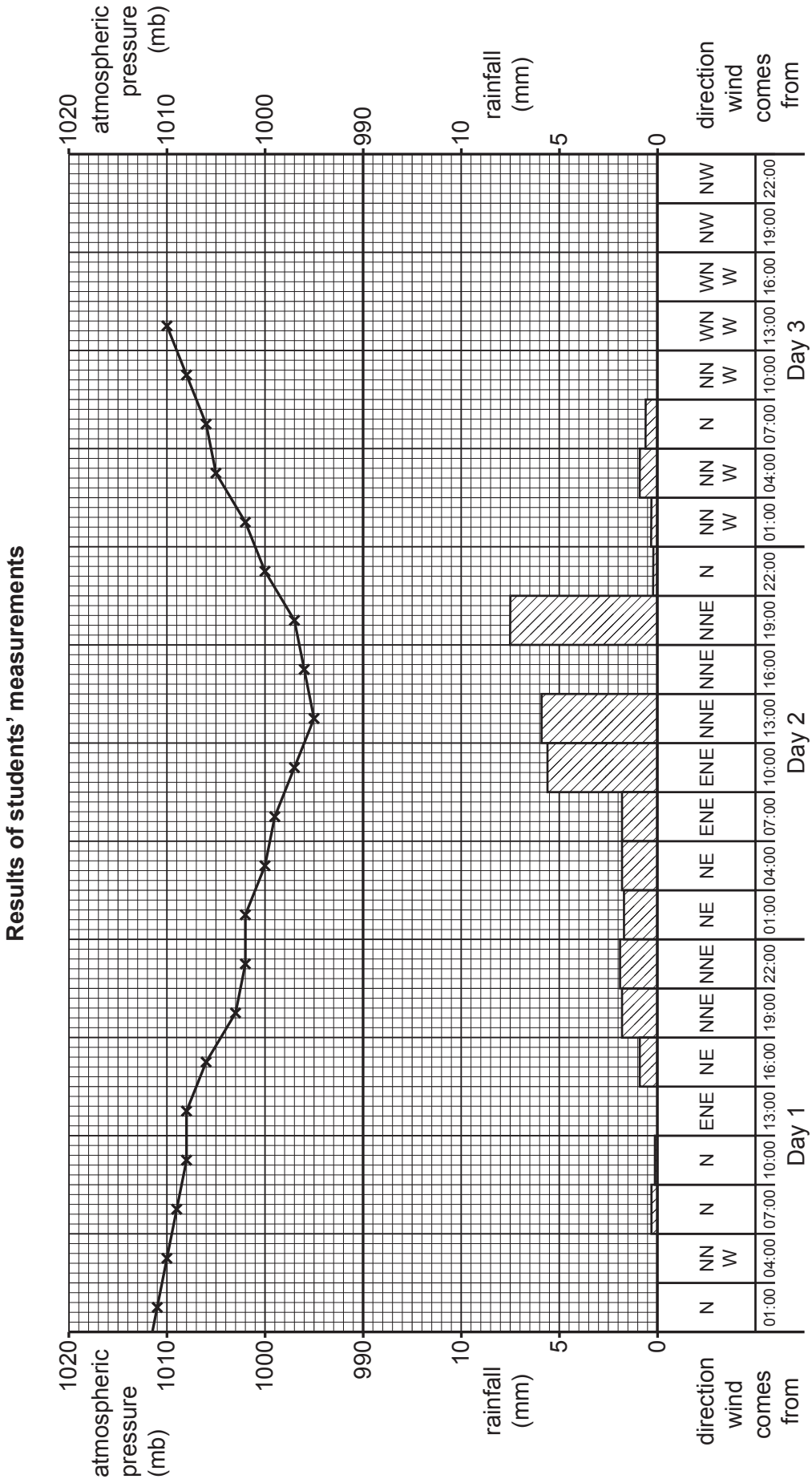

Fig. 1.2

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(i) **Complete the atmospheric pressure line graph** at 16:00, 19:00 and 22:00 hours on Day 3. [1]

(ii) **Draw the rainfall bar** at 16:00 hours on Day 2. [1]

(iii) On which day and at what time was the following set of results recorded?

Atmospheric pressure (mb)	1002
Rainfall during the last three hours (mm)	0.3
Wind direction	NNW

Day ..... Time ..... [1]

(d) Using their results, the students made conclusions about their two hypotheses.

(i) What is your conclusion to **Hypothesis 1:** *As atmospheric pressure changes rainfall amounts will vary*? Support your conclusion with data from Fig. 1.2 and Table 1.1.

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..... [4]

(ii) The students decided that **Hypothesis 2:** *Atmospheric pressure affects the direction from which the wind blows*, was **partly true**. Support their conclusion with evidence from Fig. 1.2 and Table 1.1.

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..... [3]

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(e) Another pair of students investigated how the amount of cloud cover and cloud type had changed over the three days.

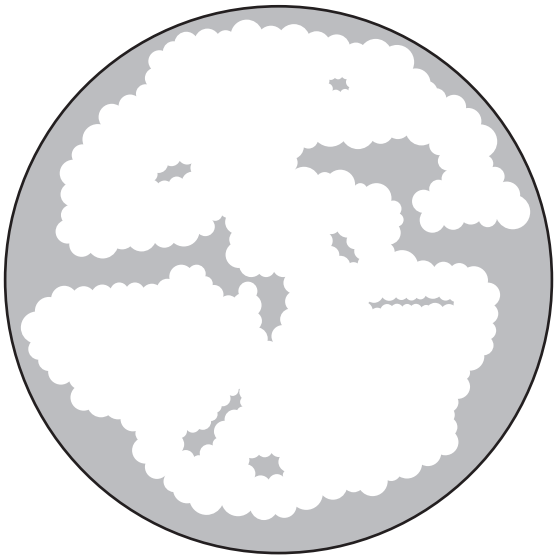
(i) Fig. 1.3 (below) shows two examples of the amount of cloud cover they recorded. The students recorded the amounts in oktas (eighths). Choose from the values below and fill in the correct number of oktas for each example. [2]

Choose from the following:

1 okta 3 oktas 7 oktas 8 oktas

Amount of cloud cover

..... oktas



..... oktas

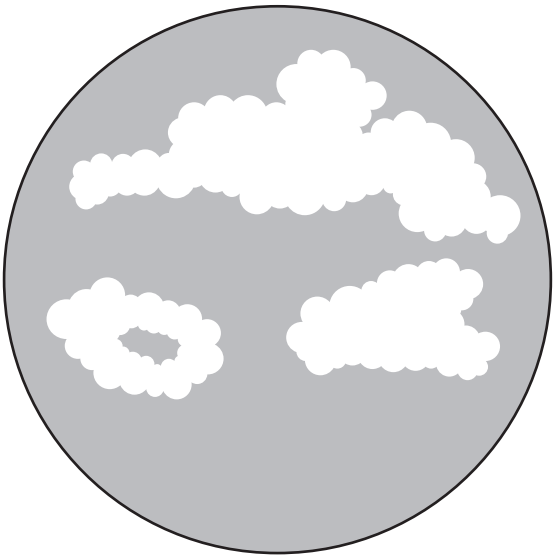


Fig. 1.3

(ii) Fig. 1.4 (Insert) shows three different types of cloud recorded by the students. Identify the cloud type in each photograph.

Type **A** .....

Type **B** .....

Type **C** ..... [3]

[Total: 30]

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2 Students were studying land use in cities. They learned that there are parts of a city where one land use is dominant and covers most of the area, and this is called a land use zone. They did fieldwork to investigate land use in their local city.

(a) To collect fieldwork data the students were divided into six groups. Each group went from the city centre outwards along main roads which were used as transect lines.

Suggest **two** reasons why the teacher split the class into groups.

1.....

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2.....

..... [2]

The students investigated the following hypotheses:

Hypothesis 1: *Residential land use is dominant (covers most of the land area) at all distances away from the city centre.*

Hypothesis 2: *The percentage of commercial land use decreases as distance from the city centre increases.*

(b) Along each transect line the students used a systematic sampling method to select locations to record the land use. Their teacher told the students to:

- record the land use every 10 metres
- only record the ground floor land use
- only record the land use on one side of the road.

Give **two** advantages and **two** disadvantages of this method.

Advantage 1

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Advantage 2

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Disadvantage 1

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Disadvantage 2

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..... [4]

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(c) Fig. 2.1 (Insert) shows the categories of land use which the students used along with examples of different types of land use.

Complete the table below by putting the types of land use into the correct land use category. One example has been completed for you.

Type of land use	Land use category
department store	commercial
concert venue	
apartment	
library	

[3]

(d) An example of the students' completed recording sheet along one section of a transect (201–400 m) is shown in Fig. 2.2 (Insert). Use these results to complete the tally chart, Fig. 2.3 below, which the students used to count the examples in the different land use categories.

[2]

Tally chart

Section of transect: 201–400 metres		
Land use category	Tally	Number
Residential	////	4
Industrial		0
Commercial (shops)		
Entertainment		
Public buildings		
Open space		
Transport		
Services (offices)		

Fig. 2.3

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(e) When they had completed their fieldwork, the students returned to school and added up the results from all transects. They used these results to draw the divided bar graphs shown in Fig. 2.4 (Insert).

(i) Which distance from the city centre is shown in Table 2.1 below?

..... metres [1]

Table 2.1

Land use category	Percentage
Residential	65
Industrial	10
Commercial (shops)	5
Entertainment	5
Public buildings	0
Open space	5
Transport	5
Services (offices)	5

(ii) What percentage of the total land use is residential between 1001 and 1200 m from the city centre?

..... % [1]

(iii) Describe **two** differences between the land use in sections 0 to 200 m and 1801 to 2000 m away from the city centre. Do **not** use statistics in your answer.

1 .....

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2 .....

..... [2]

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(iv) The students made the conclusion that **Hypothesis 1:** *Residential land use is dominant (covers most of the land area) at all distances away from the city centre* is **false**. Support this decision with evidence from Fig. 2.4 (Insert).

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(v) Suggest why the land use changes as distance from the city centre increases.

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(vi) What is the correct conclusion to **Hypothesis 2:** *The percentage of commercial land use decreases as distance from the city centre increases*? Tick (✓) your choice below and support your decision with evidence from Fig. 2.4.

	Tick (✓)
Hypothesis is true	
Hypothesis is partly true	
Hypothesis is false	

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(f) One student wanted to extend his study by investigating if the quality of the environment varied along his transect. Describe a method he could use to do this.

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[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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