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Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

5955517355655

GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **May/June 2021**

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.

This document has **16** pages.

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1 Students went to do fieldwork at Porlock Bay in south west England. The bay is shown in Fig. 1.1 (Insert). There is a shingle beach in the bay. The students decided to look for evidence that shingle moved along the coast from south west to north east.

The students worked in pairs to test the following hypotheses:

Hypothesis 1: *Beach shingle generally becomes smaller from south west to north east along the beach.*

Hypothesis 2: *Beach shingle becomes more rounded from south west to north east along the beach.*

(a) Which **one** of the features below is labelled **X** on Fig. 1.1 (Insert)?
Tick (✓) your answer below.

feature	tick (✓)
delta	
headland	
natural arch	
spit	

[1]

(b) The students had learned that longshore drift is important in moving beach material along the coast.
Which **three** of the following statements about longshore drift are correct?
Tick (✓) your answers below.

statement	tick (✓)
Backwash moves material up the beach.	
Longshore drift occurs in deep water.	
Movement of material up and down the beach is repeated with each wave.	
The prevailing wind influences the direction of longshore drift movement.	
Swash moves material down the beach.	
The direction of longshore drift depends on the direction of the tide.	
Waves approach the coastline at an angle.	

[3]

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(c) Explain why their teacher suggested the following safety precautions before the students began their fieldwork.

Make sure that their cell (mobile) phone is fully charged.

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.....

Check the weather forecast for the area.

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Check the times of high and low tide.

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..... [3]

(d) To investigate the two hypotheses the students collected pieces of shingle at 15 sites along the beach. These sites are shown in Fig. 1.2 (Insert). Describe a sampling method to collect 10 pieces of shingle at **each** site. Refer to equipment the students could use.

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..... [3]

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(e) To investigate **Hypothesis 1:** *Beach shingle generally becomes smaller from south west to north east along the beach*, the students used the fieldwork equipment shown in Fig. 1.3 (Insert).

(i) Describe how they measured the long axis of each piece of shingle using this equipment.

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..... [2]

(ii) The results of the students' measurements at the 15 sites are shown in Table 1.1 (Insert).

Plot the mean (average) length of the long axis measurement at site 6 on Fig. 1.4 below. [1]

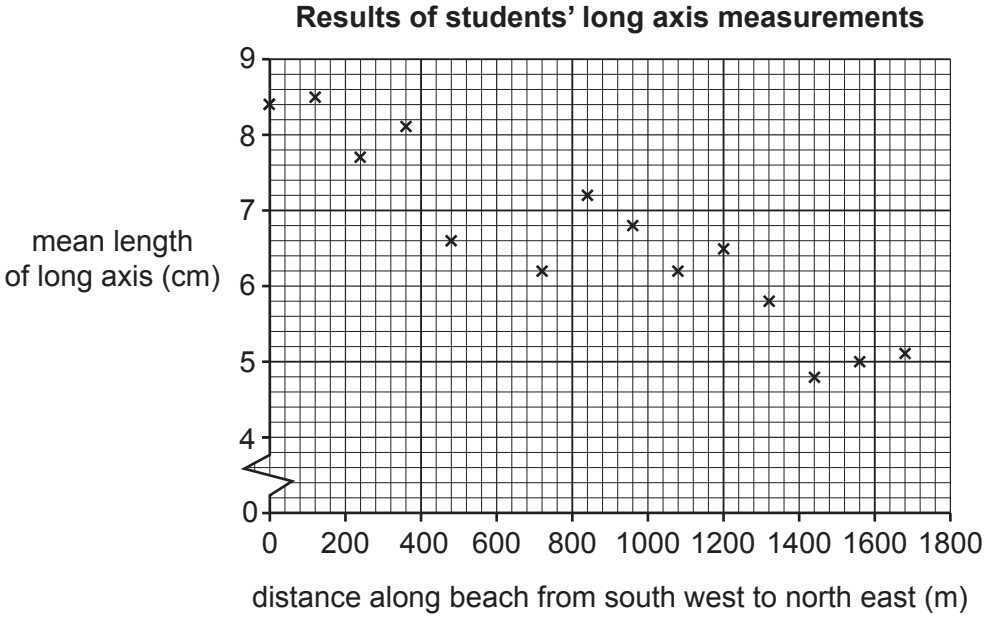

Fig. 1.4

(iii) **Draw a best-fit line** on Fig. 1.4. [1]

(iv) What conclusion would the students make about **Hypothesis 1:** *Beach shingle generally becomes smaller from south west to north east along the beach*? Support your answer with evidence from Fig. 1.4 and Table 1.1.

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..... [3]

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(f) To investigate **Hypothesis 2:** *Beach shingle becomes more rounded from south west to north east along the beach*, each pair of students used the roundness index shown in Fig. 1.5 (Insert). They compared each of the 10 pieces of shingle they collected with the index, and each student gave it a roundness score.
A pair of students' results at site 1 are shown in Table 1.2 below. Student A then calculated a total index score for the site.

Table 1.2

Student A and Student B's results of site 1 measurements

Student A's results for site 1

roundness class	**very angular**	**angular**	**slightly angular**	**slightly rounded**	**rounded**	**very rounded**
roundness score	1	2	3	4	5	6
number of pieces of shingle collected	2	2	3	1	2	0
index score	2	4	9	4	10	0
					total index score =	29

Student B's results for site 1

roundness class	**very angular**	**angular**	**slightly angular**	**slightly rounded**	**rounded**	**very rounded**
roundness score	1	2	3	4	5	6
number of pieces of shingle collected	3	2	4	0	1	0
index score						
					total index score =	

(i) Student B's results for the same 10 pieces of shingle at site 1 are also shown in Table 1.2. **Calculate the total index score** for Student B's results. **Show your calculation by completing the index scores and total index score** in Table 1.2. [2]

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(ii) Suggest why the students' roundness index scores may be less reliable than their measurements of the long axis of shingle for Hypothesis 1.

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..... [2]

(iii) The pair of students discussed and agreed the roundness score for each piece of shingle at the other sites. Their total index results at each site are shown in Table 1.3 (Insert). **Plot the total index score** for site 15 on Fig. 1.6 below. [1]

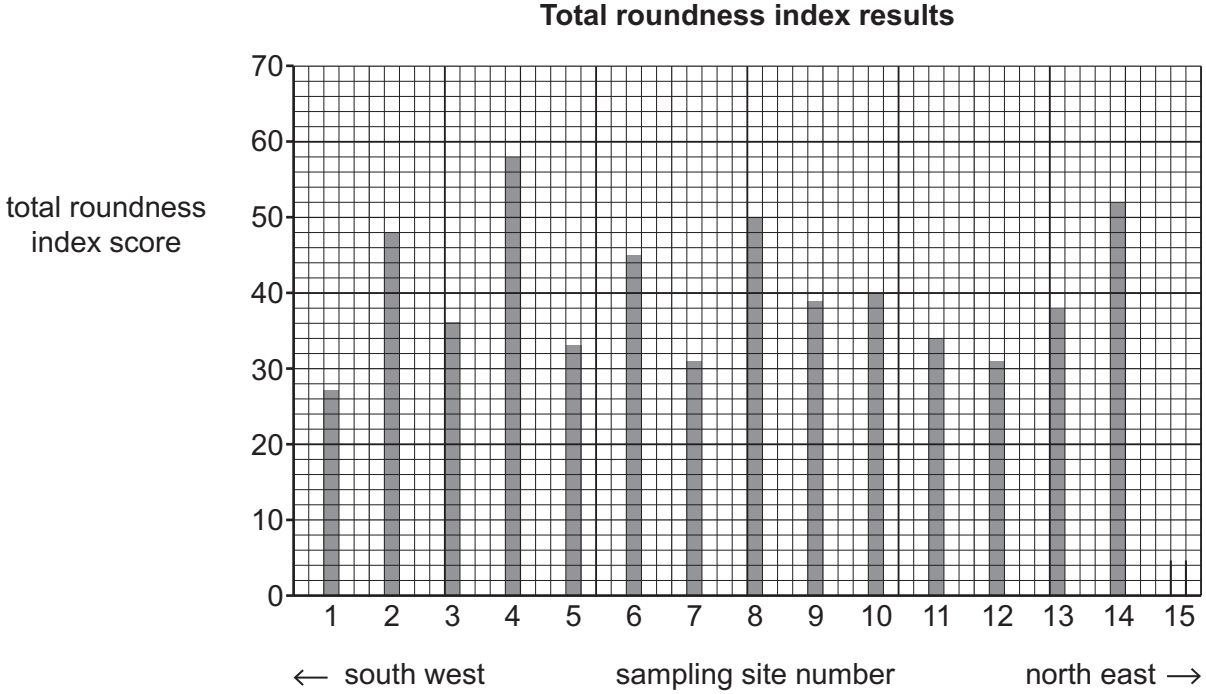

Fig. 1.6

(iv) Do the results of the fieldwork support **Hypothesis 2:** *Beach shingle becomes more rounded from south west to north east along the beach*? Support your decision with data from Fig. 1.6 and Table 1.3.

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..... [3]

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(g) In the west of Porlock Bay the students saw some groynes like the one shown in Fig. 1.7 (Insert).
Explain why groynes are built on a beach.

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..... [2]

(h) To extend their fieldwork the students measured wave frequency in Porlock Bay. Describe a method the students could use to measure wave frequency.

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..... [3]

[Total: 30]

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2 Students who lived in a settlement near the edge of a large city in the UK were studying how their town had grown from a small village.

(a) Which **one** of the following describes the area where the town has grown?
Tick (✓) your choice.

	tick (✓)
inner city	
inner suburbs	
rural-urban fringe	
transition zone	

[1]

(b) Look at Fig. 2.1 (Insert), a map of the settlement.

(i) Describe the shape of the original village.

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.....

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..... [2]

(ii) Use evidence from Fig. 2.1 to describe how the settlement has grown since 1980.

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..... [2]

(iii) Suggest **two** reasons for the expansion of the settlement.

1 .....

.....

2 .....

..... [2]

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(c) The students used the national census website to find information about the population of the settlement. The results are shown in Table 2.1 (Insert).

(i) Why is the national census website 'secondary' data?

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..... [1]

(ii) Use the data in Table 2.1 to complete Fig. 2.2 below. [1]

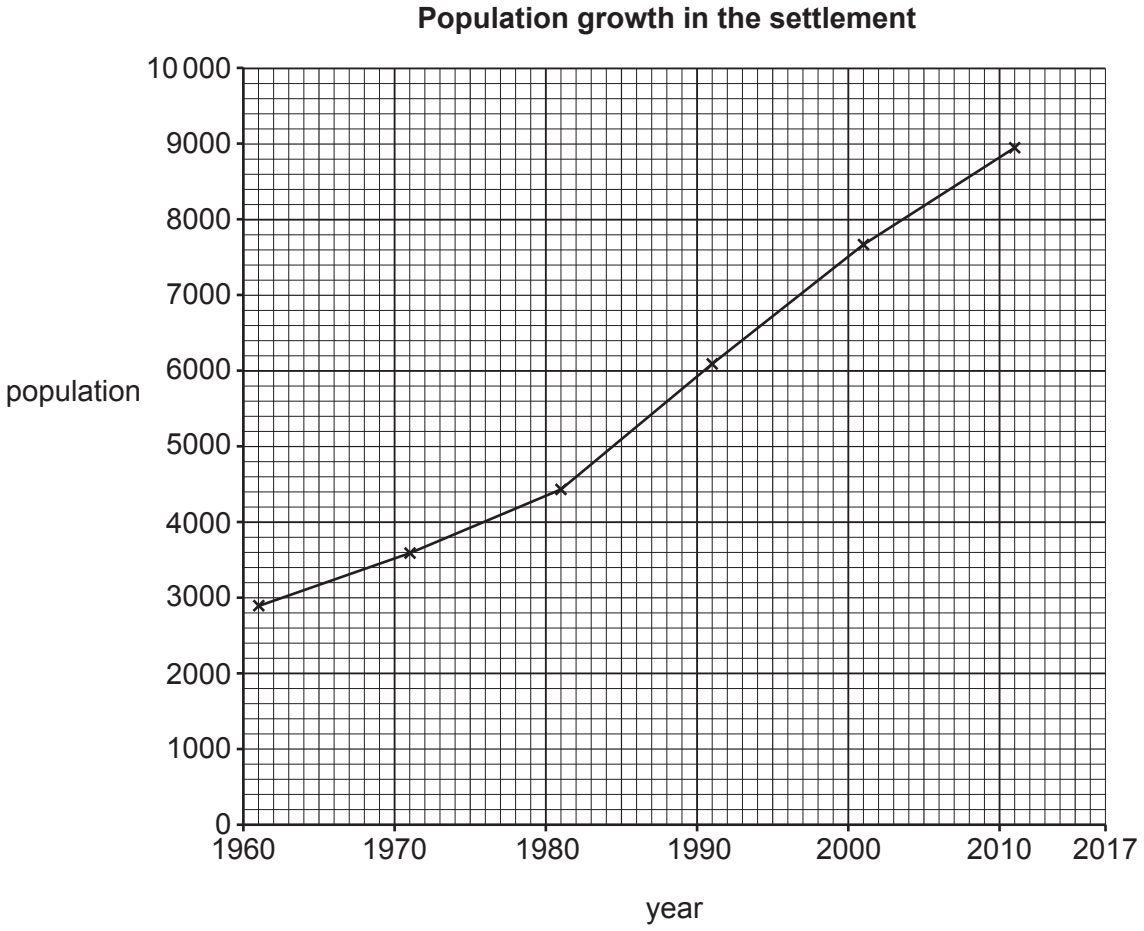

Fig. 2.2

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The students decided to test the following hypotheses:

Hypothesis 1: *Most people have lived in the settlement for less than 20 years.*

Hypothesis 2: *Most people who live in the settlement travel more than 20 km to work.*

(d) To investigate their hypotheses the students made a questionnaire. They decided to stand on the main street and asked people who were in the working age group of 18 to 65 to complete the questionnaire.

(i) Suggest a suitable day and time for the students to carry out the questionnaire survey.

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

(ii) Give a reason for your answer to **(d)(i)**.

.....

..... [1]

(iii) Their teacher suggested some things to do and things not to do while using a questionnaire. **Use the suggestion number** to put the following ideas under the correct headings in Table 2.2 below. [2]

1. Ask the person's name
2. Be polite
3. Explain why you are doing the survey before you ask questions
4. Keep the questionnaire short
5. Only ask people who are sitting down
6. Stand in a shop doorway to do the questionnaire

Table 2.2

things to do	things not to do
number	number .....
number	number .....
number	number .....

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(e) The students' questionnaire is shown in Fig. 2.3 (Insert).

(i) How could the students make sure that they only used their questionnaire with people who lived in the town?

.....

..... [1]

(ii) The students asked every tenth person who passed them on the street to complete their questionnaire. Which **one** of the following is the correct term for this sampling method? Tick (✓) your answer below. [1]

	tick (✓)
precise	
simple	
specific	
systematic	
tally	

(f) The results of Question 1 in the questionnaire are shown in Table 2.3 (Insert).

(i) Use the results in Table 2.3 to **complete the pie graph**, Fig. 2.4, below. [2]

Answers to Question 1

How long have you lived in the town?

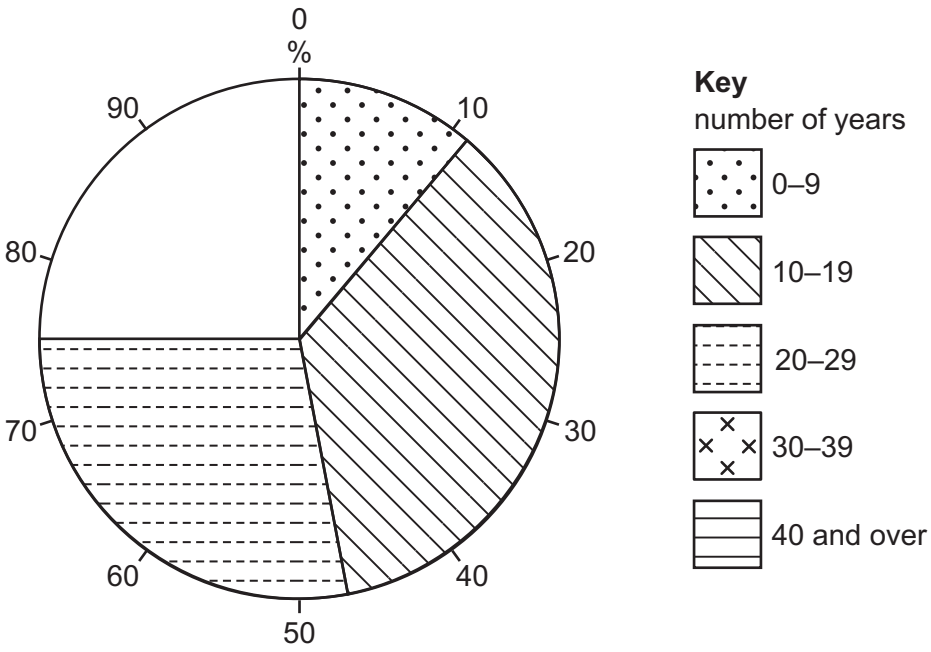

Fig. 2.4

(ii) What conclusion did the students make to **Hypothesis 1:** *Most people have lived in the settlement for less than 20 years*? Support your answer with evidence from Fig. 2.4 and Table 2.3.

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..... [3]

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(iii) The results of Question 2 in the questionnaire are shown in Table 2.4 (Insert).

Use these results **to complete the histogram**, Fig. 2.5 below, to show the percentage of people who travel between 21 and 30 km to get to work. [1]

Answers to Question 2

How far do you travel to your workplace?

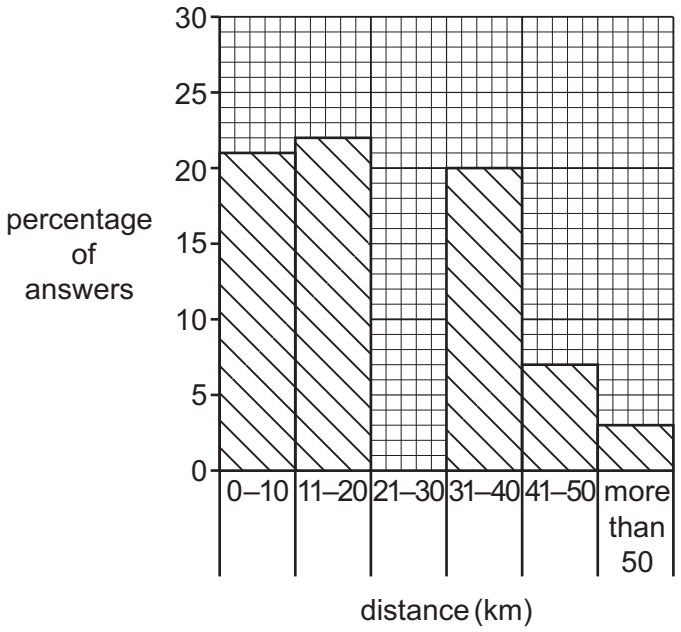

Fig. 2.5

(iv) Do you think **Hypothesis 2:** *Most people who live in the settlement travel more than 20 km to work* is **correct**? Support your conclusion with evidence from Fig. 2.5 and Table 2.4.

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..... [2]

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(g) The students put the answers to Question 3 'What is your main reason for living in the town?' into six groups. These groups are shown in Fig. 2.6 below.

good access to the motorway
nearby countryside is good for relaxation
born in the town
low crime rate
convenient public transport routes
affordable house prices

Fig. 2.6

In which group in Fig. 2.6 would the following answers to Question 3 be included?

The town is a safe place for my family.

Group .....

There is a quick rail link to my workplace in the nearby city.

Group .....

There are plenty of open areas nearby for walking.

Group ..... [3]

(h) Suggest how the growth of the settlement has affected local people and the local natural environment.

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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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