UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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**GEOGRAPHY** **0460/41**

Paper 4 Alternative to Coursework **May/June 2010**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

Additional Materials: Calculator
Ruler

**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 a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE ON ANY BARCODES.

Answer **all** questions.
The Insert contains Photograph A, Tables 1 and 3 and Fig. 5 for Question 1 and Fig. 6 and Table 4 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.

The number of marks is given in brackets [ ] at the end of each question or part question.

| For Examiner's Use | |
|---|---|
| Q1 | |
| Q2 | |
| Total | |

This document consists of **15** printed pages, **1** blank page and **1** Insert.

**1** A group of students was investigating the effects of groynes on a beach.
Groynes are structures built out into the sea to stop or slow down longshore drift.
A groyne is shown in Photograph A (Insert).

**(a)** State **two** safety precautions that the students should take when doing fieldwork on a beach.

1 .....

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2 .....

..... [2]

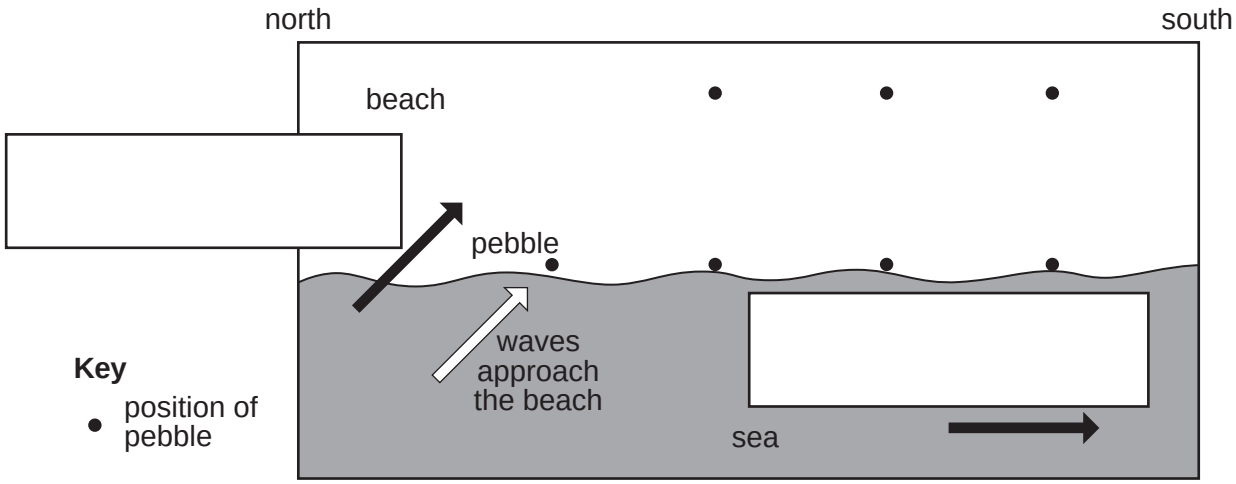
The students decided to investigate the following hypotheses:

**Hypothesis 1** *Groynes reduce the movement of material along a beach*

**Hypothesis 2** *Groynes affect the beach profile*

**(b) (i)** Complete Fig. 1, below, to show the movement of a pebble by longshore drift.

**Plan view of movement of beach material by longshore drift**




[2]

**Fig. 1**

**(ii)** Write the following labels in the correct boxes on Fig. 1.

*Direction of longshore drift*

*Direction of the prevailing wind*

[1]

**(iii)** Explain the process of longshore drift.

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..... [3]

**(c) (i)** First, the students investigated the direction and rate of longshore drift. To [illegible] they painted 50 pebbles from the beach in bright red paint and left them in a g[illegible] where the waves were coming up the beach.

Suggest why the students painted the pebbles

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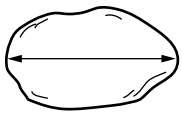
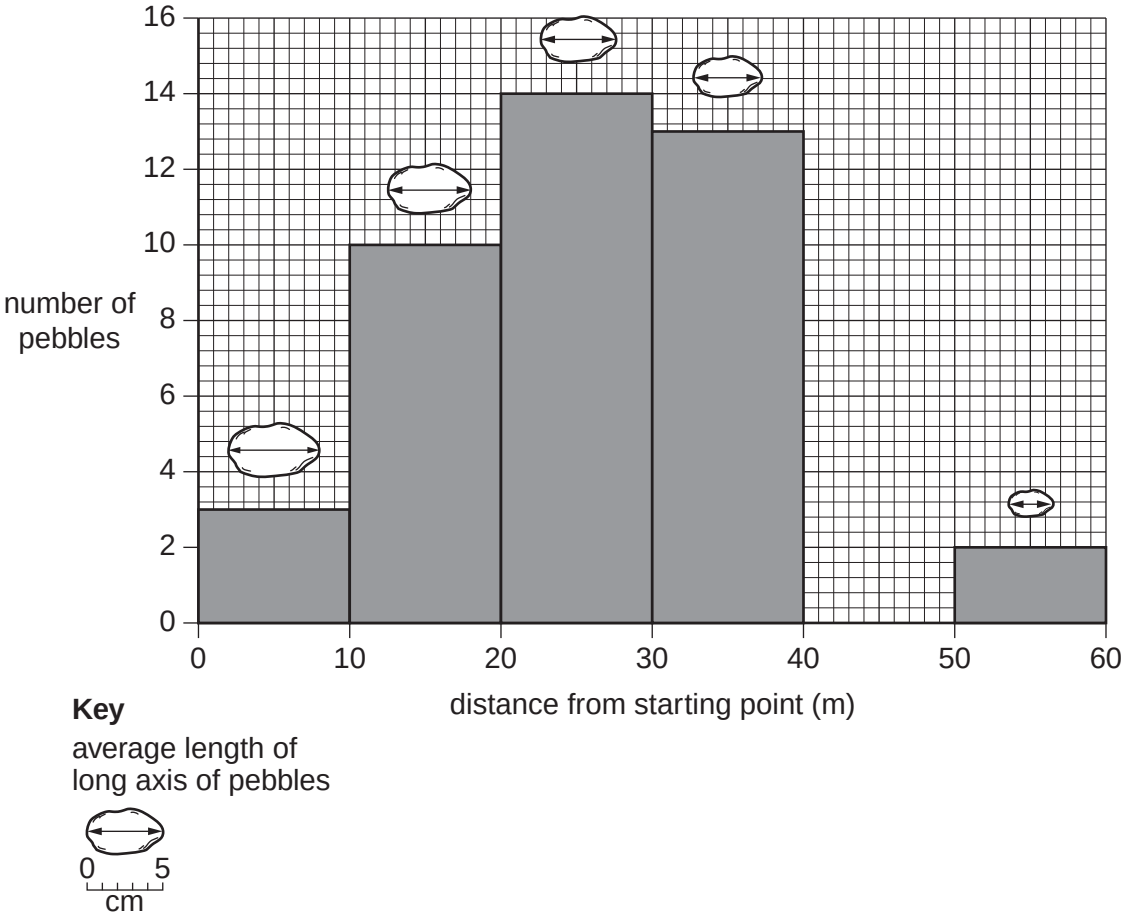
.....[1]

**(ii)** Later, the students measured the distance each pebble had been moved along the beach, and they measured the long axis of each pebble, as shown on the sketch below. The results are summarised in Table 1 (Insert).



Use the information from Table 1 to complete Fig. 2 below by filling in the missing bar and long axis measurement.

**Result of longshore drift**




[2]

**Fig. 2**

**(iii)** What did the students learn from this investigation about the impact of long... drift on the movement of pebbles?

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..... [3]

**(d)** Look again at Photograph A (Insert). The students took measurements every five [illegible] along the groyne away from point **X**.
At each five metre point they measured from the top of the groyne to the beach materi[illegible] on both the north and south side, as shown on Fig. 3 below.

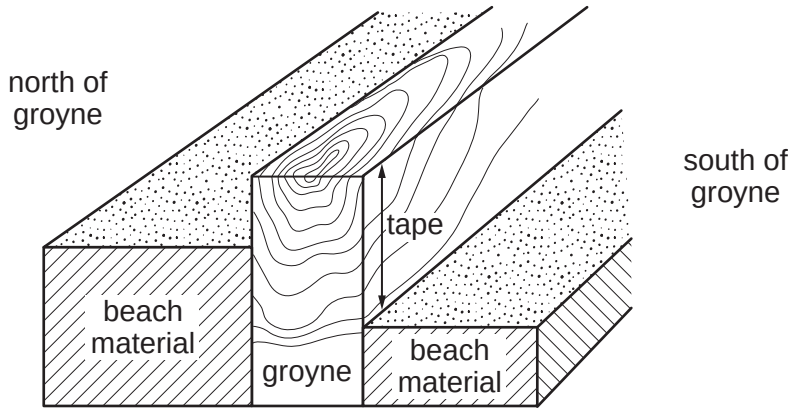


**Fig. 3**

The measurements are shown on Table 2 below.

**Table 2 Build up of beach material either side of the groyne**

| Distance from X (m) | Measurement from top of groyne to beach material | |
|---|---|---|
| | North side (m) | South side (m) |
| 0 | 0 | 0.9 |
| 5 | 0.3 | 1.2 |
| 10 | 1.1 | 1.5 |
| 15 | 0.9 | 1.3 |
| 20 | 0.8 | 1.2 |
| 25 | 0.5 | 1.3 |
| 30 | 1.2 | 1.4 |
| 35 | 1.5 | 1.6 |
| 40 | 1.5 | 1.7 |
| 45 | 1.6 | 1.8 |
| 50 | 1.7 | 1.9 |
| 55 | 1.8 | 1.9 |
| 60 | 1.9 | 2.0 |
| **Average** | **1.1** | |

**(i)** Estimate the average measurement from the top of the groyne to the beach material on the south side of the groyne.
Choose your estimate from the following and write your answer on Table 2.

1.2m 1.5m 1.9m

[1]

**(ii)** Use the data from Table 2 to complete Fig. 4 below. Draw in the bars for 5
10m on the south side of the groyne.

[4

**Build up of beach material either side of a groyne**

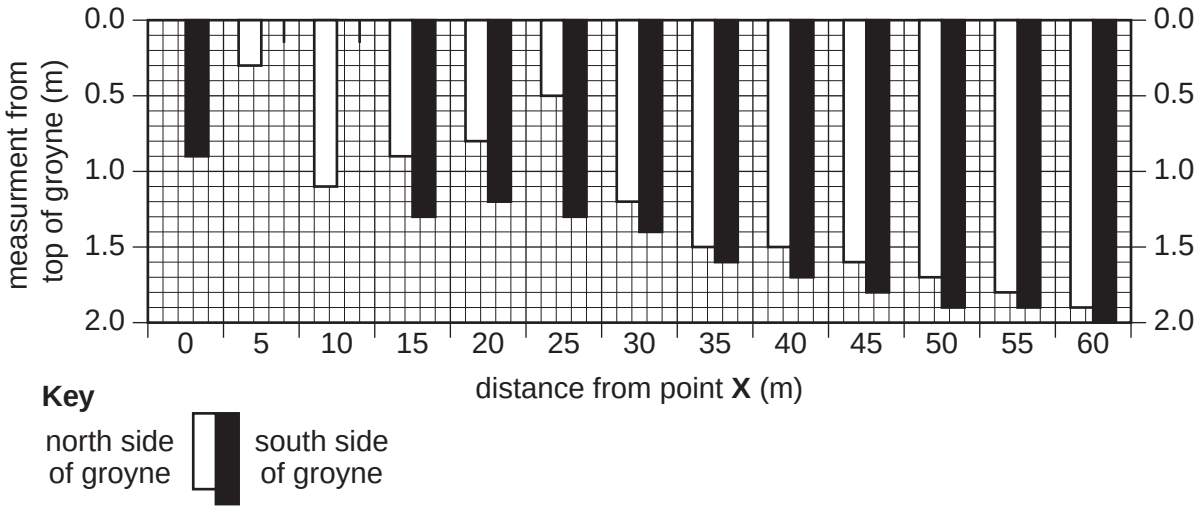


**Fig. 4**

**(iii)** What conclusion could the students make about **Hypothesis 1** *Groynes reduce the movement of material along a beach*? Use data from Table 2 and Fig. 4 to support your answer.

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.....[3]

**(e)** Next, the students did an investigation to see how the groynes affect the beach (**Hypothesis 2**).

**(i)** Describe how they would measure a beach profile to get the results shown in Table 3 (Insert). You may draw a sketch to help you.
The students used the following equipment:

- Two ranging poles
- A clinometer
- A tape measure
- A recording sheet

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..... [4]

**(ii)** The students plotted their results to create the beach profiles shown on Fig. 5 (Insert).
Describe **two** differences between the beach profiles north and south of the groyne.

1 .....

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2 .....

..... [2]

**(iii)** What conclusion could the students reach about **Hypothesis 2** *Groynes a* *beach profile*?

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..... [1]

**(f)** Later, the students discussed their beach fieldwork and how they could have improved the accuracy and reliability of their results.
What suggestions could they have made?

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..... [3]

[Total: 30 marks]

**2** Students wanted to investigate some characteristics of the CBD (Central Business Dis… a town. Fig. 6 (Insert) shows the centre of the town. The students decided to map pedes… flows and interview shoppers in order to test the following hypotheses:

**Hypothesis 1** *The numbers of pedestrians decrease away from the central point of the CBD*

**Hypothesis 2** *Shoppers have different opinions about the CBD*

**(a)** The point marked **X** on Fig. 6 (Insert) was identified as the central point of the CBD from which the students made their measurements. Give **three** characteristics which the students may have used to decide on the central point of the CBD.

1 .....

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2 .....

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3 .....

.....[3]

**(b)** The students wanted to make their fieldwork as accurate as possible, so they measured distances of 100m, 200m and 300m away from the central point along the roads in each direction. The survey sites are shown on Fig. 6 (Insert). At each site, they did a pedestrian count lasting 10 minutes at five different times during the day.

**(i)** A copy of the recording sheet used by the students is shown on Fig. 7 below. Complete the recording sheet by inserting the correct total.

**Recording sheet**

| | |
|---|---|
| Street name: | Bluebell Street |
| Distance from central point: | 200m |
| Time of survey: | 08.00 to 08:10 |

| Tally | Total |
|---|---|
| 𝍸 𝍸 𝍸 \|\| | |

[1]

**(ii)** Suggest **one** advantage and **one** disadvantage of their method of selecting sites for the pedestrian counts.

Advantage .....

.....

Disadvantage .....

.....[2]

**(iii)** Study the results of the three survey sites on Bluebell Street which are shown in Table 4 (Insert).

Give **two** reasons why the students did the pedestrian count at five different times during the day.

1 .....

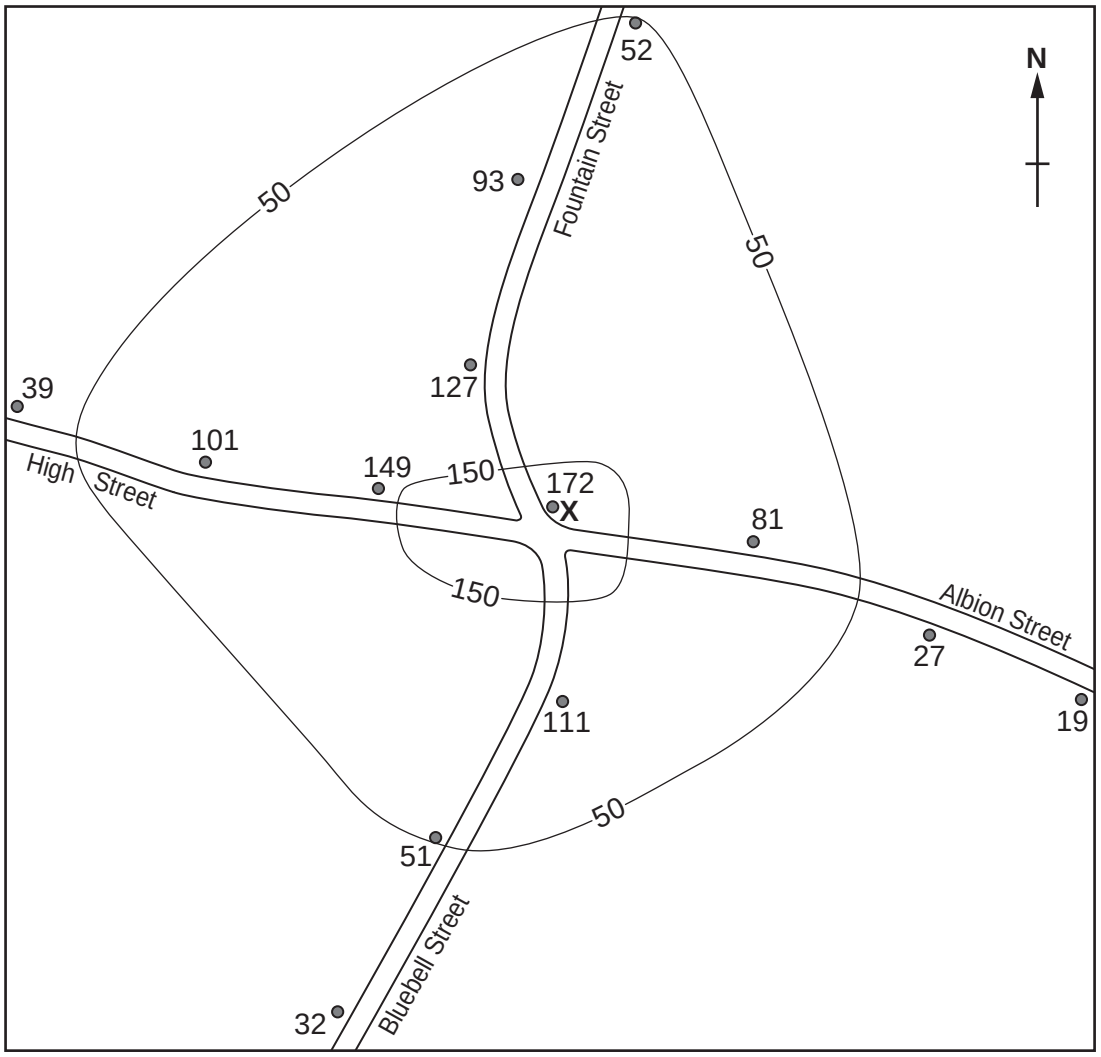
.....

2 .....

.....[2]

**(c)** The results of the pedestrian counts are mapped with isolines on Fig. 8 below.

**Result of the pedestrian count**




**Key**

- survey site and total number of pedestrians recorded
- **X** central point
- 50 isoline
- over 150 pedestrians

0 100 200 300 m

**Fig. 8**

**(i)** Using the key provided on Fig. 8, shade in the area where more than 150 pedestrians were recorded. [1]

**(ii)** On Fig. 8, draw the isoline to show 100 pedestrians. [2]

**(iii)** To what extent does the information on Fig. 8 support **Hypothesis 1** *The ne... of pedestrians decrease away from the central point of the CBD*?

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.....[2]

**(iv)** Use the information on Fig. 6 (Insert) to suggest why pedestrian flows vary within the study area.

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.....[2]

**(v)** The outdoor market was closed on the day of the pedestrian counts. To extend their fieldwork, the students repeated the pedestrian counts on a day when the outdoor market was open between 08.00 and 13.00 hours.
What difference would you expect the students to find between the results of the two days?

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.....[3]

**(d)** To investigate **Hypothesis 2**, the students devised a questionnaire to discover opinions shoppers had about the CBD. The questionnaire is shown on Fig. 9 below.

**Questionnaire**

| | | | |
|---|---|---|---|
| Age group | Under 20 | 20 – 60 | Over 60 |
| Gender | Male | Female | |

**Question 1**

**What attracts you to the CBD?**

- ☐ Close to home or work
- ☐ Good variety of shops
- ☐ .....
- ☐ .....

**Question 2**

**What concerns you about the CBD?**

- ☐ Overcrowded at weekends
- ☐ Too much litter and graffiti
- ☐ .....
- ☐ .....

**Fig. 9**

**(i)** Describe **one** appropriate sampling method to obtain an accurate sample of people to be interviewed.

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.....[3]

**(ii)** Add **two** more possible attractions and **two** more possible concerns in the spaces on the questionnaire (Fig. 9). Use different ideas and not just opposites. [4]

**(e)** Having completed the questionnaire and obtained their results, the students cons... how to use them. Use the following headings to suggest how they could have used... results of their questionnaire.

Graphs to show their results .....

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Analysis of their results .....

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Recommendations to the town council .....

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.....[5]

[Total: 30 marks]

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