UNIVERSITY OF CAMBRIDGE INTERNATIONAL EX
International General Certificate of Secondary Educati

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CAN NUMBER

9015379125

GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **May/June 2013**

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 Photographs A and B, Table 2 and Fig. 2 for Question 1, and Figs 5 and 7 and Table 5 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.

For Examiner's Use	
Q1	
Q2	
Total	

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

© UCLES 2013

PA CAMBRIDGE

1 Three students in New Zealand were investigating the characte decided to do fieldwork at five sites along the Orere River.

The two hypotheses which the students tested were:

Hypothesis 1: *Width, depth and wetted perimeter of the river cha*

Hypothesis 2: *Rocks on the river bed become smaller and more*

(a) Before beginning their fieldwork the students discussed the fi to do.

(i) Suggest **three** factors the students should have considered in choosing their five fieldwork sites.

1 .....

.....

2 .....

.....

3 .....

.....[3]

(ii) The students decided to do a trial (pilot) study at a different river site near their school. Give **two** advantages of doing a trial (pilot) study.

1 .....

.....

2 .....

.....[2]

© UCLES 2013

(b) To investigate **Hypothesis 1** the students measured the wid
the depth of the river at points across the channel.

Photographs A and B (Insert) shows them involved in this wor
students using and how are they making their measurements

width of channel .....

.....

.....

.....

.....

depth of river .....

.....

.....

.....

.....[4]

© UCLES 2013

PA CAMBRIDGE

(c) The students measured the depth of the river at 0.5 m interva
results of their measurements at site 3 are shown in Table 1,

Table 1

Results at site 3

Distance across channel (m)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0				
Depth of river (m)	0.02	0.05	0.07	0.11	0.13	0.17	0.18	0.16	0.21	0.27	0.25	0.15

(i) Use these results to complete the cross-section of the channel at site 3 and shade in the river channel on Fig. 1 opposite. [2]

(ii) The wetted perimeter is the part of the channel cross-section which the river touches. This is labelled at site 2 on Fig. 1 (opposite).

Describe a method that the students could use to measure the wetted perimeter.

.....

.....

.....

.....[2]

(iii) The wetted perimeter is one factor which affects a river's speed of flow (velocity). Give **two** other factors which also affect the speed of flow of a river.

1 .....

.....

2 .....

.....[2]

© UCLES 2013

Cross-sections at sites 1–5

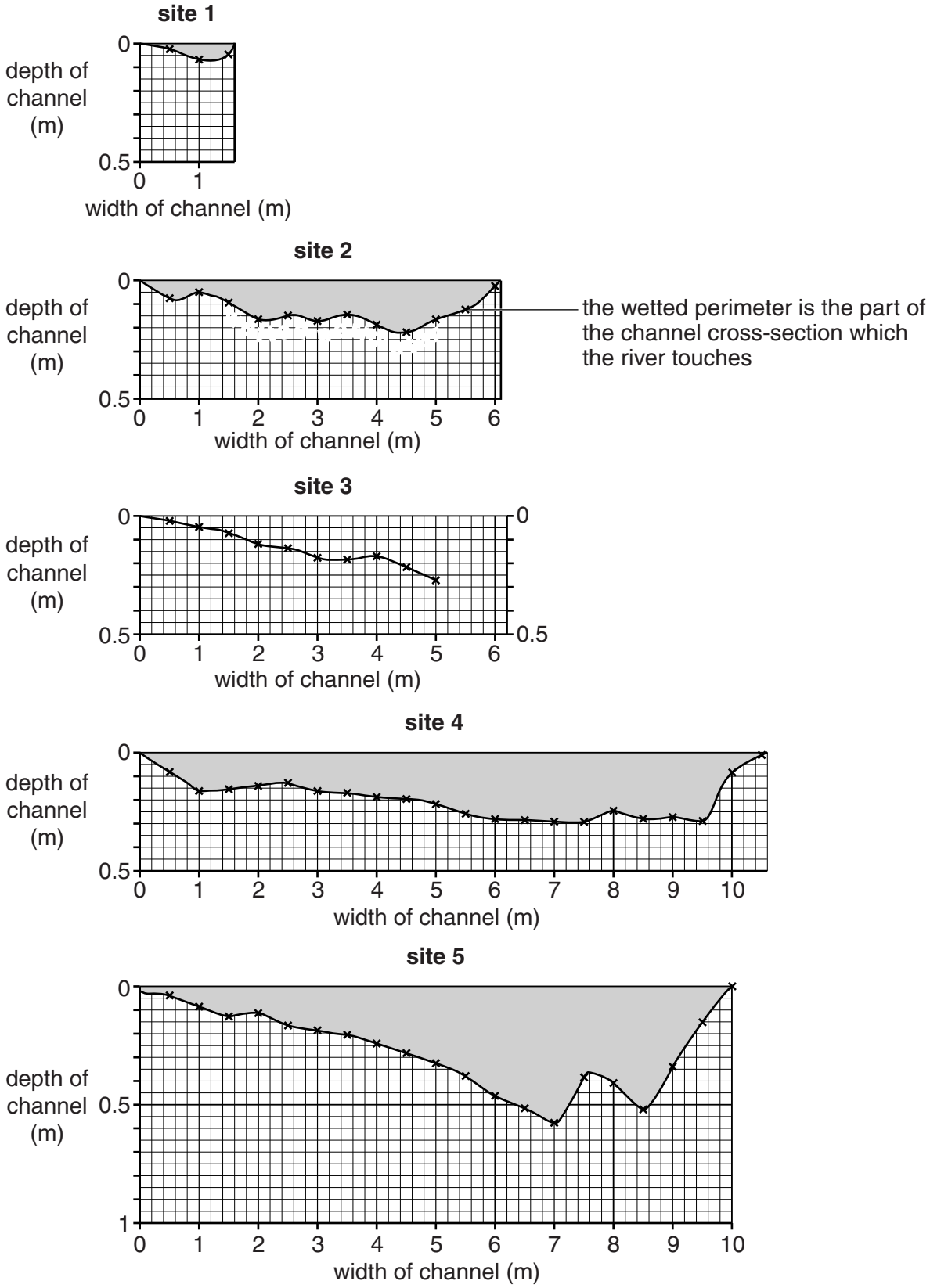


Fig. 1

© UCLES 2013

PA CAMBRIDGE

(iv) The students produced a summary table of their meas
This is shown in Table 2 (Insert).

What conclusion did the students make about **Hypoth**
wetted perimeter of the river channel increase downstre

Use evidence from Table 2 and Fig. 1 to support the con

.....

.....

.....

.....

.....

.....

.....

.....[4]

(d) The students then made some measurements to investigate **Hypothesis 2:** *Rocks on the river bed become smaller and more rounded downstream.*

(i) At each site a student selected 10 rocks at random from the bed of the river. He then measured the size and roundness of the rocks using the equipment shown in Fig. 2 (Insert). Suggest how he made the two measurements.

rock size .....

.....

roundness of rock .....

.....[2]

The results of the student's work are shown in Table 3 below.

Table 3

Results of student's work

Site	1	2	3	4	5
Average (mean) rock size (cm)	29.3	24.5	22.5	14.5	3.5
Average Roundness score	1.1	1.9	2.1	3.2	4.4

© UCLES 2013

PA CAMBRIDGE

(ii) Plot the average rock size and roundness score for site

Rock measurements

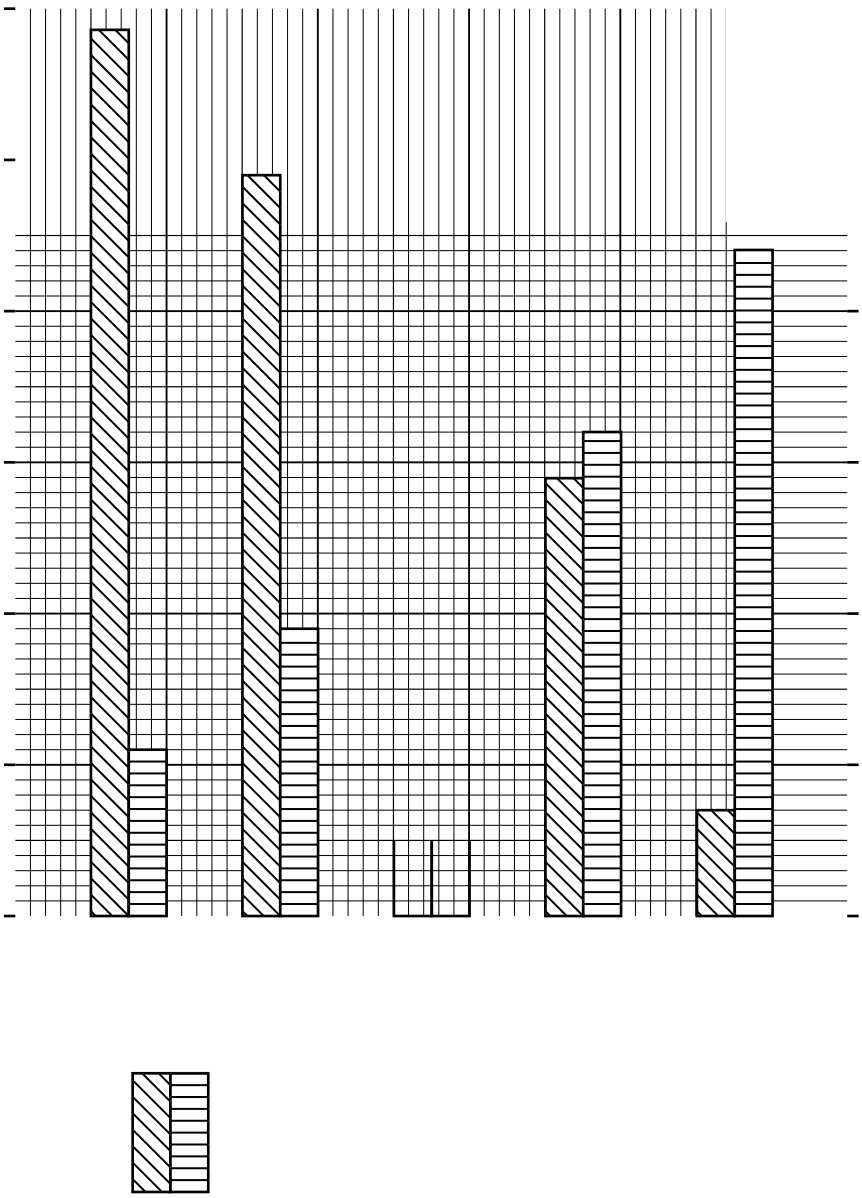


Fig. 3

(iii) What conclusion would the students make about **Hypothesis 2:** *Rocks on the river bed become smaller and more rounded downstream*?

.....

.....[1]

© UCLES 2013

PA CAMBRIDGE

(iv) Suggest why rock size and roundness change downstre

.....

.....

.....

.....

(e) Suggest **four** ways that the students could have improved th
to make their results for both hypotheses more reliable.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

.....[4]

[Total: 30 marks]

© UCLES 2013

2 A group of students in Botswana visited Jwaneng, a mining tow where most mining is done by blasting and drilling at, or near, the

(a) Mining is an important industry in Botswana. This is shown T

Table 4

Economic sectors of Botswana

Economic sector	% of GDP*
Service industries	45
Mining	36
Manufacturing industries	16
Agriculture	3

*GDP is a measurement of the total value of goods and services produced in a country

(i) Which **one** of the following sectors of industry produces the highest percentage of Botswana's GDP? Circle your answer below. [1]

Primary Secondary Tertiary

(ii) Use the data in Table 4 to complete the pie chart, Fig. 4 below. [2]

Percentage of GDP by economic sector in Botswana

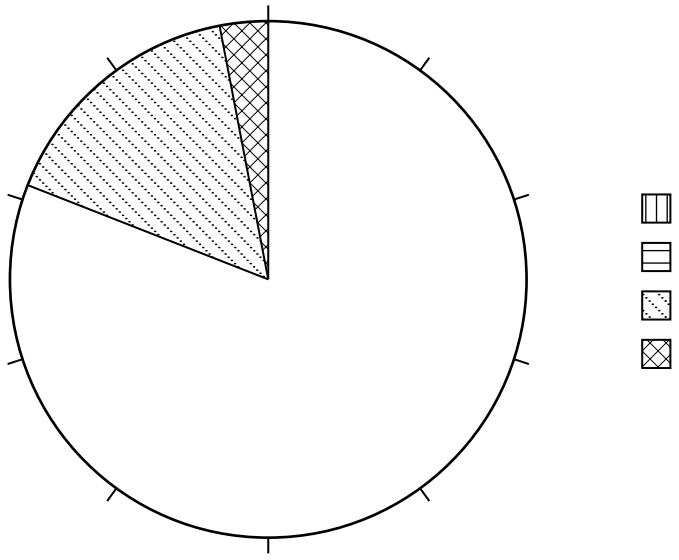


Fig. 4

© UCLES 2013

PA CAMBRIDGE

The two hypotheses which the students tested were:

Hypothesis 1: *The mine has a negative impact on local people in*

Hypothesis 2: *Workers at the mine gained benefits from moving i*

(b) In Jwaneng the students used a questionnaire with local resi
of the mine. This questionnaire is shown in Fig. 5 (Insert).

(i) Before using the questionnaire the students thought ab
use of it. They decided to ask the opinions of 50 people.

Describe a suitable sampling method for the students to select 50 people. Explain why you have chosen this method.

Name of sampling method .....

Description of sampling method .....

.....

.....

Why this sampling method was chosen .....

.....

.....[3]

(ii) When they showed their questionnaire to their teacher she suggested that they should start the questionnaire by asking:

'Do you live in Jwaneng?'

Why do you think the teacher made this suggestion?

.....

.....

.....

.....[2]

(iii) Having completed their survey the students classified their results.

The answers to Question 2 (What do you think are the local benefits of this mine?) and Question 3 (What do you think are the main problems caused by this mine?) are shown in Table 5 (Insert).

Use this data to complete the bar graphs in Figs 6A and 6B opposite. [2]

© UCLES 2013

PA CAMBRIDGE

Answers to Questions 2 and 3

Local benefits of this mine

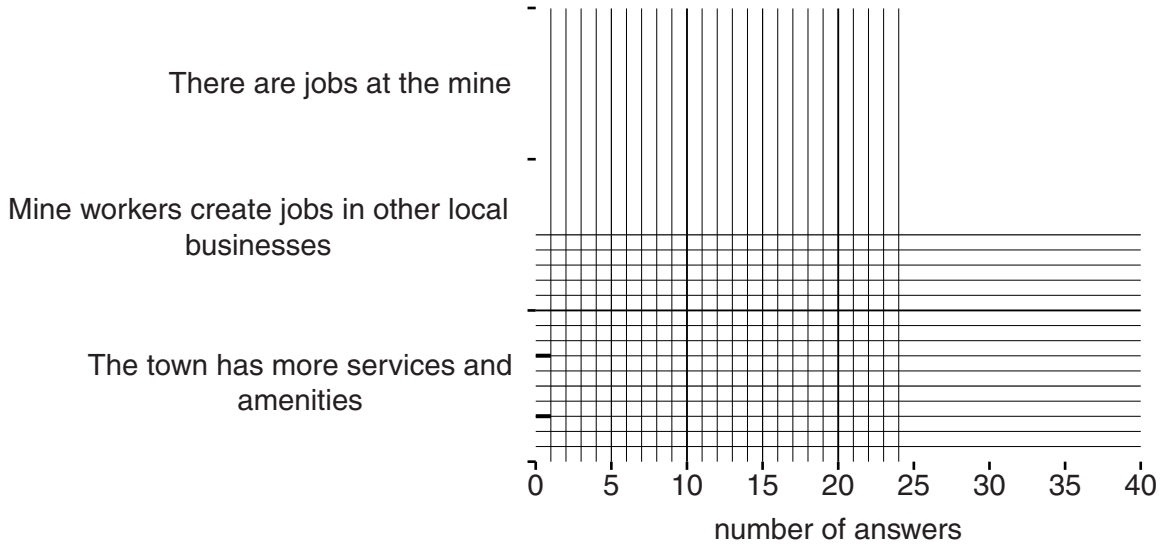


Fig. 6A

Main problems of this mine

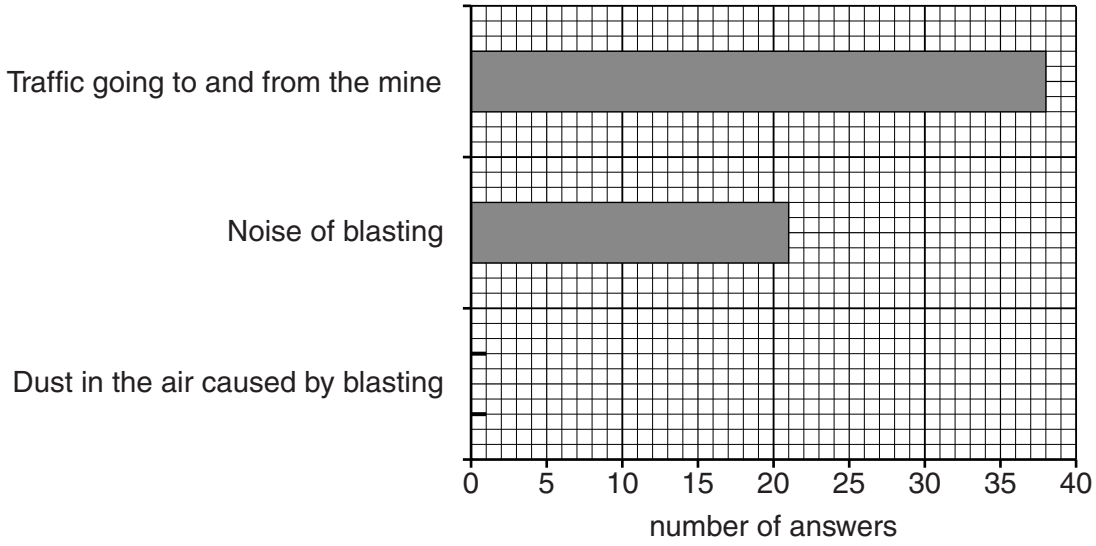


Fig. 6B

© UCLES 2013

IPA CAMBRIDGE

(iv) Answers to Question 4 (Overall do you think this min people?) are shown in Table 6 below.

Table 6

Answers to Question 4

Good for local people	42 people
Bad for local people	8 people

What conclusion did the students make about **Hypothesis 1:** *The mine has a negative impact on local people in Jwaneng*? Support your answer with evidence from Tables 5 and 6 and Figs 6A and 6B.

.....

.....

.....

.....

.....

.....

.....

.....[4]

(v) Suggest **three** ways to overcome the problems of the mine suggested in answers to Question 3 in the questionnaire shown in Table 5.

1 .....

.....

2 .....

.....

3 .....

.....[3]

© UCLES 2013

BLANK PAGE

Question 2(c) begins on page 14

© UCLES 2013

PA CAMBRIDGE

(c) The students used a different questionnaire to investigate **Hy** *gained benefits from moving to Jwaneng.*

This questionnaire, which they used with workers at the mine

(i) The students decided to plot the answers to Question 1 (you moved to work at the mine?) on the flow line map, Fi

Towns where miners at Jwaneng mine previo

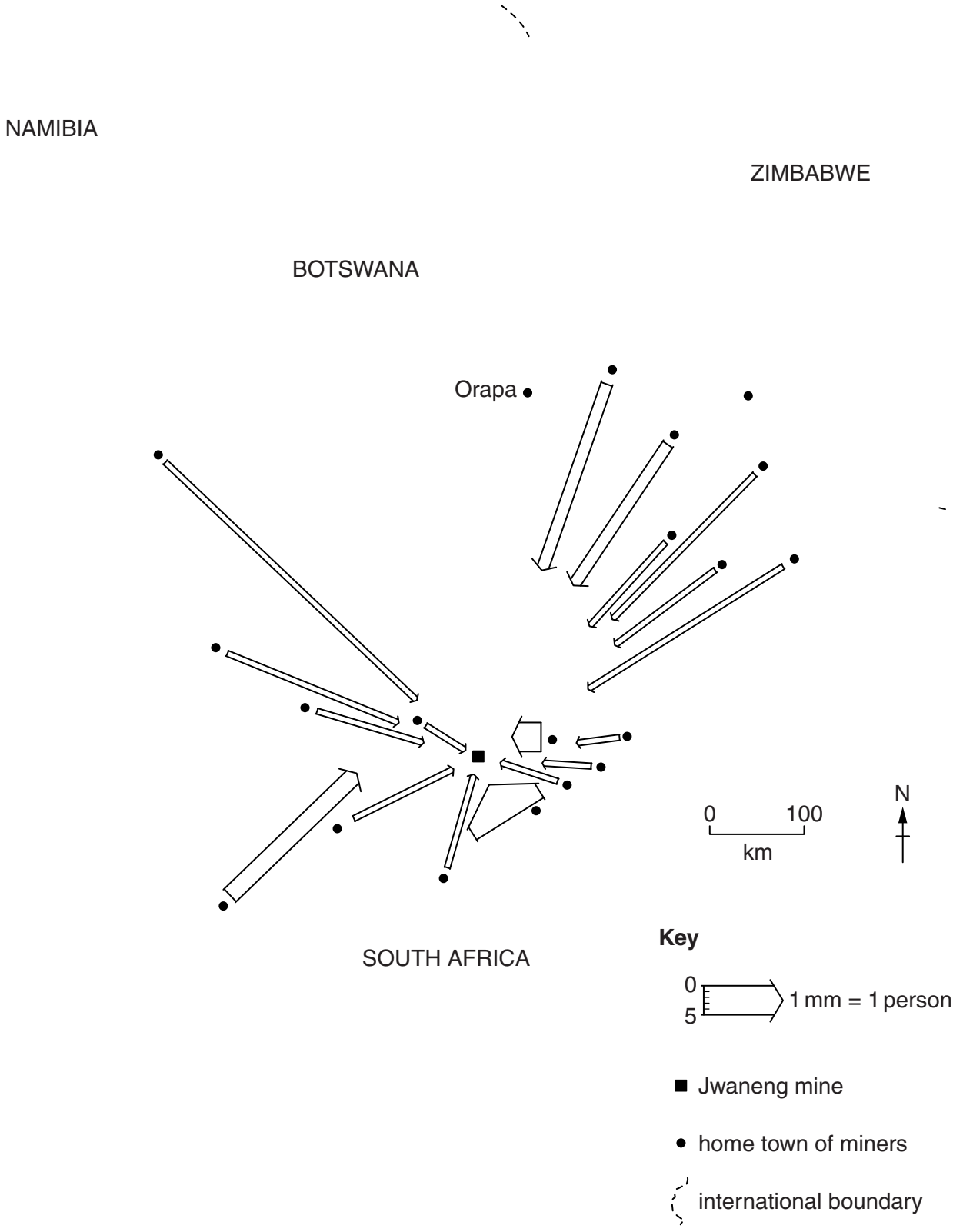


Fig. 8

© UCLES 2013

Plot the information in Table 7 below onto Fig. 8 (opposit

Table 7

Town	Number of workers
Orapa	5
Francistown	1

(ii) Describe **three** features of the distribution of the towns they came to work at Jwaneng.

1 .....

.....

2 .....

.....

3 .....

.....[3]

(iii) Why is the flow line map shown in Fig. 8 an appropriate method to show this data?

.....

.....

.....

.....[2]

© UCLES 2013

PA CAMBRIDGE

(iv) Some answers to Question 2 (Why did you move to wor in Table 8 below.

The students reached the conclusion that **Hypothesi** *gained benefits from moving to Jwaneng* was generally

Which **three** answers in Table 8 best support their co choices below.

Table 8

Answers to Question 2:
Why did you move to work at the mine?

Answers	Tick ✓
Working in a mine is better paid than jobs in my home town	
No qualifications to get any other job	
Not allowed to work in South Africa where wages are higher	
Relatives already worked at the mine	
Send money to my family back home	
There are no jobs in my home town	

[3]

(d) The students could have asked the mine workers about problems of working at the mine. Suggest **three** possible problems for these workers.

1 .....

.....

2 .....

.....

3 .....

.....[3]

[Total: 30 marks]

Copyright Acknowledgements:

Question 1 Photograph A © Anna Vaughan; www.rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Fieldwork+techniques/Rivers.
Question 1 Photograph B © Amy Hatchwell; www.rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Fieldwork+techniques/Rivers.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2013