

RIVER VALLEY HIGH SCHOOL
General Certificate of Education Advanced Level
Preliminary Examination 2018
Higher 2

GEOGRAPHY
Paper 2 Data Response Questions

9751/02
18 September 2018

3 hours

Additional Materials: Answer Paper
 1 Insert
 World outline map
 Cover Page

READ THESE INSTRUCTIONS FIRST

Write your name, admission number and class on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Candidates answer **all** questions.

The Insert contains all the Resources referred to in the questions.
You should make reference to appropriate examples studied in the field or the classroom, even where such examples are not specifically requested by the question.
Diagrams and sketch maps should be drawn whenever they serve to illustrate an answer.
The world outline map may be annotated and handed in with relevant answers.
You are reminded of the need for good English and clear presentation in your answers.

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

This document consists of 4 printed pages.



[Turn over

Section A

Theme 4 – Geographical Investigation

Answer **one** question from this section.

- 1** A group of 6 students observed that a section of the Bukit Batok Canal in the western part of Singapore was refurbished with rain gardens as part of the Public Utilities Board's (PUB) 'Active, Beautiful and Clean' (ABC) Waters Programme. Rain gardens help to manage surface runoff in urban areas in a more sustainable manner, by controlling the quantity and quality of surface runoff to prevent pluvial flooding, through natural filtration and encouraging subsurface conveyance of water into catchments.

The students wanted to study the effectiveness of the rain garden project in Bukit Batok by measuring infiltration rates of surfaces adjacent to the canal. Breaking into 2 teams, each team of 3 students concurrently took readings from 10 randomly sampled sites along the segment that underwent refurbishment (as seen in Photograph 'A'), and 10 randomly sampled sites along the segment that remained unchanged (as seen in Photograph 'B'). The infiltration readings were taken on two separate occasions over a period of 2 days owing to inclement weather interrupting the fieldwork after readings from 5 sites were sampled.

Equipment used for each team:

- Double-ring Infiltrometer
- Stopwatch
- Bottles of water
- Printed recording sheets and writing materials
- Large scale map of the study area

The infiltration readings were plotted into infiltration rate graphs.

Resource 1 shows the study area with the location of the sample sites as well as photographs of the two contrasting segments of the Bukit Batok Canal. Photograph 'A' shows a section that was refurbished with rain gardens and recreational infrastructure. Photograph 'B' shows a stretch of the canal that was not included in the refurbishment. Resource 2 shows the recording sheet and equipment that was used for the fieldwork. Resource 3 shows two infiltration rate graphs constructed from 2 site readings, one for 'A' sample sites and one for 'B' sample sites.

- (a)** Suggest a suitable research question for this investigation about infiltration rates. [1]
- (b)** With reference to Resources 1 and 2, explain two potential risks associated with carrying out this geographical investigation and how the group might minimise each risk. [4]
- (c)** Referring to Resource 2, explain how the students used the equipment to measure the infiltration rate at a data site. [5]
- (d)** The students reflected that the findings might have been compromised by intervening factors. With reference to Resources 1, 2 and 3, discuss how the process of data collection could be improved. [7]
- (e)** Discuss the value of this geographical investigation and its potential contribution to the management of urban runoff in Bukit Batok. [8]

Section B
Theme 1: Tropical Environments
Tropical Climates

- 2** Resource 4 shows the global distribution of atmospheric pressure in December and June. Resource 5 shows the global radiation balance in December and June. Resource 6 shows the Oceanic Niño Index (ONI), which shows warm/El Niño (red) and cold/La Niña (blue) phases of abnormal sea surface temperatures in the tropical Pacific Ocean from 1950 to 2018. Resource 7 shows selected significant climate anomalies and events in June 2017.
- (a) Compare the global pattern of atmospheric pressure in December with that in June as shown in Resource 4. [3]
 - (b) With reference to Resource 5, explain the seasonal change in the earth's radiation balance. [4]
 - (c) Referring to Resources 4 and 5, discuss the extent to which atmospheric pressure may be attributed to solar heating. [7]
 - (d) Comment on the periodicity of El Niño events from 1950 to 2018 according to the Oceanic Niño Index in Resource 6. [3]
 - (e) With reference to Resources 6 and 7, discuss the validity of the notion that El Niño Southern Oscillation (ENSO) related events aggravate the impacts of climate change as much as they are affected by it. [8]

Theme 2: Development, Economy and Environment
FDI, TNCs and GPNs

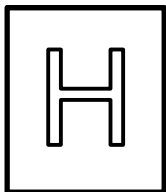
- 3** Resource 8 shows the foreign direct investment (FDI) into China, a medium income country in Asia, in 1992 and 2006. Resource 9 shows a plan of the Gateway City Industrial Estate in Thailand, also a medium income country in Asia, in 2008. Resource 10 shows the global production network (GPN) which supports the construction of BMW's Mini car. BMW is a German based automobile manufacturing company and is headquartered in Munich, Bavaria, Germany.
- (a) Describe the changes in FDI shown in Resource 8. [3]
 - (b) Suggest reasons for the changes you have described in (a). [5]
 - (c) Using evidence from Resource 9, describe the characteristics of the industrial estate which make it an attractive location for foreign transnational corporations (TNCs). [4]
 - (d) Describe and suggest reasons for BMW's GPN as illustrated in Resource 10. [4]
 - (e) Using Resources 8, 9 and 10, as well as your own knowledge, recommend whether BMW should consider changing its current GPN in favour of Asian countries like China and Thailand. Justify your answer. [9]

Theme 3: Sustainable Development Urban Reimaging in the UK

- 4** Despite the UK being a relatively small country there is considerable variation in economic activity between places. Reading (southern England) and Middlesbrough (northeast England) are similarly sized urban areas in the UK as shown in Resource 11. Resource 12 shows job type in Reading and Middlesbrough. Resource 13 breaks down people in the two urban areas by economic activity. Resource 14 illustrates the demographic characteristics of Reading and Middlesbrough. Resource 15 shows images of both urban areas.

Since 2010, the UK government has attempted to measure 'national wellbeing' by conducting a survey asking people about how they feel about their lives. Results from 2015 for Reading and Middlesbrough are shown in Resource 16. Resource 17 shows some examples of the use of logos and slogans in the rebranding of rural and urban places.

- (a)** With reference to Resources 12 and 13, which urban area is considered more economically successful? Explain your answer. [4]
- (b)** Using Resources 14, 15 and 16, which urban area might be more in need of urban reimaging? Explain your answer. [5]
- (c)** With reference to Resource 17, evaluate the strengths and limitations of such rebranding strategies. [5]
- (d)** Apart from what is shown in Resource 17, describe other strategies to improve the image of urban places. [3]
- (e)** Would urban reimaging necessarily improve the liveability of urban places? Discuss with reference to the resources and your own knowledge. [8]



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READ THESE INSTRUCTIONS FIRST

This Insert contains all the Resources referred to in the questions.

This document consists of 13 printed pages and 1 blank page.



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Resource 1 for Question 1 Study Area



Resource 2 for Question 1
Data Recording Sheet and Fieldwork Equipment

Site no:		Date:					
Type: A / B		Description:					
Reading on clock (hr min)	Time Difference (min)	Cumulative Time (min)	Water level Readings		Infiltration (mm)	Infiltration rate (mm/min)	Cumulative Infiltration
			Before filling (mm)	After filling (mm)			
11 00	Start - 0	Start = 0	-	100			Start = 0
	2				(100-92) 8	(8/2) 4.00	
11 02		(0+2) 2	92	100			(0+8) 8
	3				(100-93) 7	(7/3) 2.33	
11 05		(2+3) 5	93	99			(8+7) 15



**Double-ring
infiltrometer**

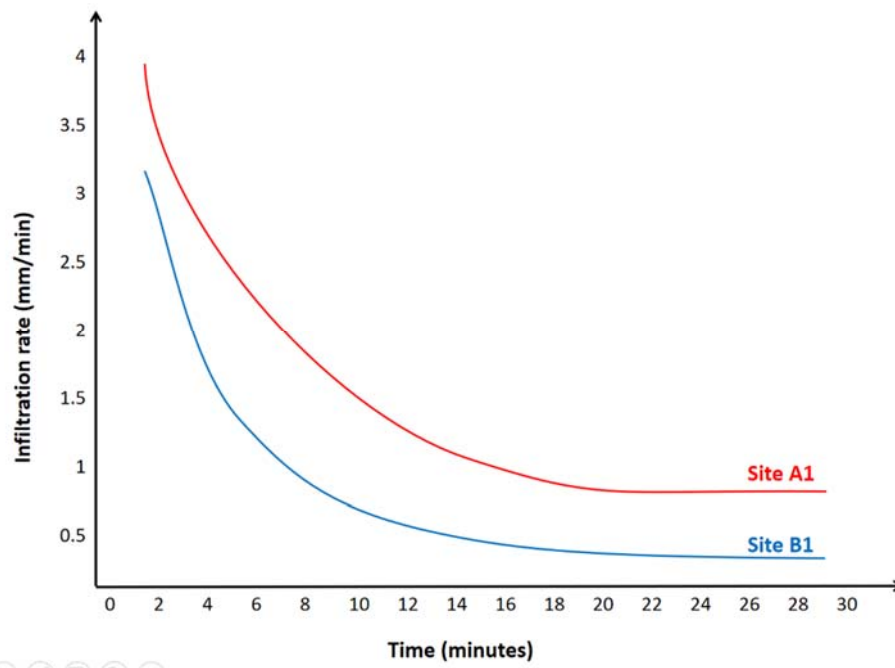


Stopwatch

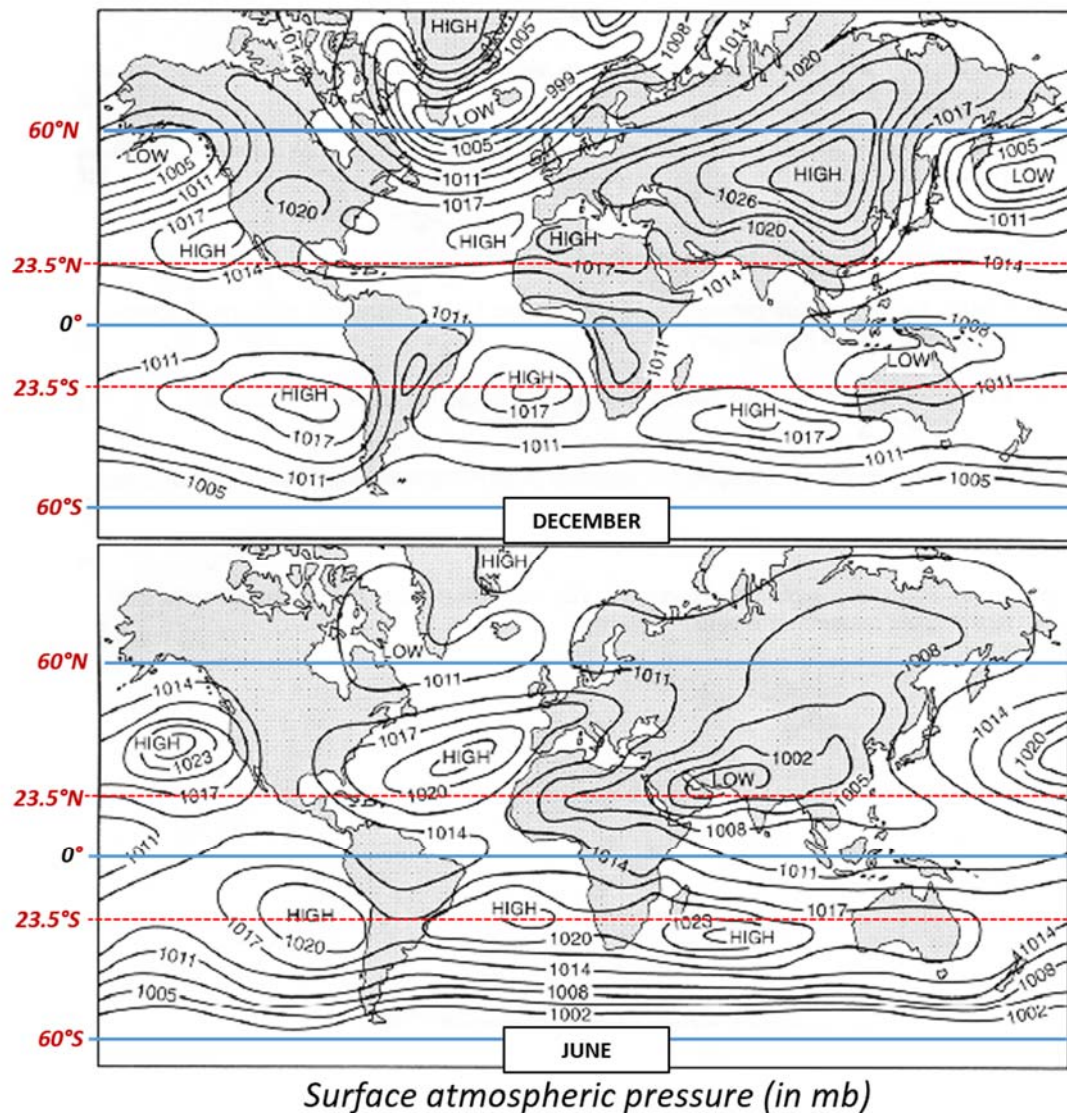


Bottles of water

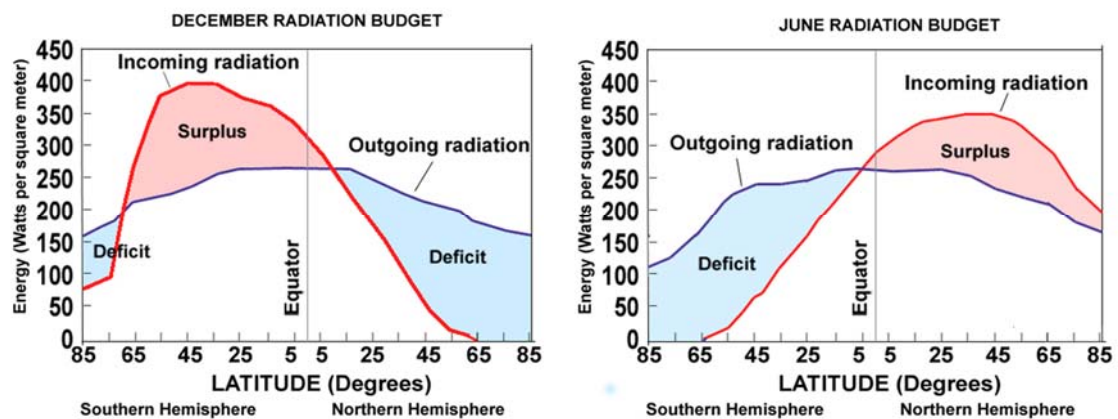
Resource 3 for Question 1
Infiltration Graphs



Resource 4 for Question 2
Global Atmospheric Pressure Distribution

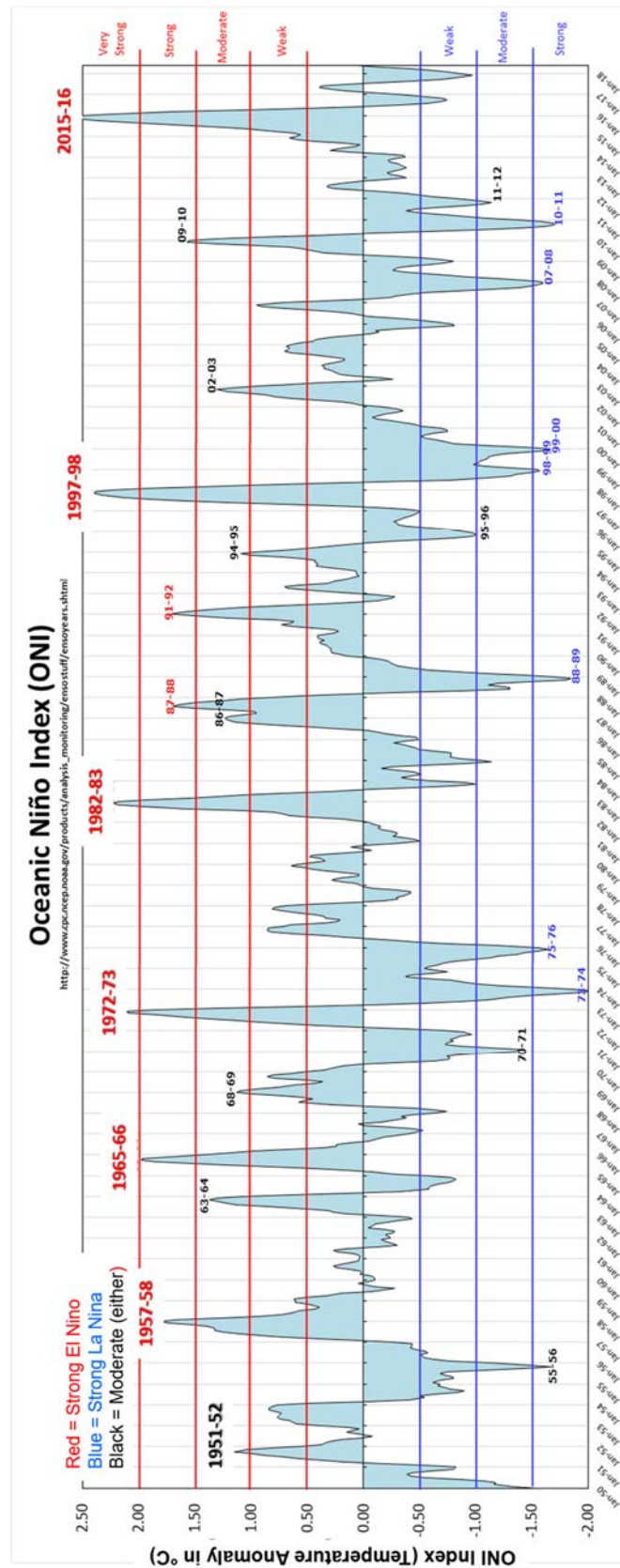


Resource 5 for Question 2
Global Radiation Budget in December and June



Resource 6 for Question 2

The Oceanic Niño Index (ONI)



Resource 7 for Question 2

Selected Significant Climate Anomalies and Events in June 2017

Selected Significant Climate Anomalies and Events June 2017

GLOBAL AVERAGE TEMPERATURE

June 2017 average global land and ocean temperature was the third highest for June since records began in 1880.

NORTH AMERICA

North America had its 10th highest June temperature since continental records began in 1910.

CONTIGUOUS UNITED STATES

A heat wave impacted the Southwest in mid-June, with many locations observing near or above all-time temperature records. Arizona had its second highest June temperature on record, behind 2016.

SOUTH AMERICA

Much-warmer-than-average temperatures were observed across much of northern and central South America in June. South America as a whole had its third highest June temperature on record.

EUROPE

Much of Europe experienced warmer to much-warmer-than-average conditions during June 2017. A heat wave impacted much of western and central Europe during mid-June. Overall, June 2017 tied with 2007 as the second highest June temperature in the 108-year record.

ANTARCTIC SEA ICE EXTENT

June 2017 sea ice extent was 6.3 percent below the 1981–2010 average—the second smallest June sea ice extent on record, behind 2002.

ARCTIC SEA ICE EXTENT

June 2017 sea ice extent was 7.5 percent below the 1981–2010 average—the sixth smallest June sea ice extent since satellite records began in 1979.

ASIA

Near-to-cooler-than-average conditions were observed across western Russia, while the majority of the continent had warmer to much-warmer-than-average conditions. June 2017 was the eighth highest June temperature in the 108-year record. Of note, the Kingdom of Bahrain, in the Middle East, had its sixth highest June temperature (tying with 2010 and 2016) since 1902.

AFRICA

Much-warmer-than-average temperatures engulfed much of Africa during June 2017, with several locations experiencing record warmth. Overall, this was Africa's highest June temperature on record.

AUSTRALIA

Drier-than-average conditions were present across much of Australia during June 2017, with several locations experiencing record dry conditions. June 2017 was the nation's second driest June since 1900, behind 1940.

NEW ZEALAND

Much of New Zealand experienced drier-than-average conditions. Several stations south of Auckland city had less than 50% of June normal precipitation. Many locations in western North Island had record or near-record low rainfall totals.

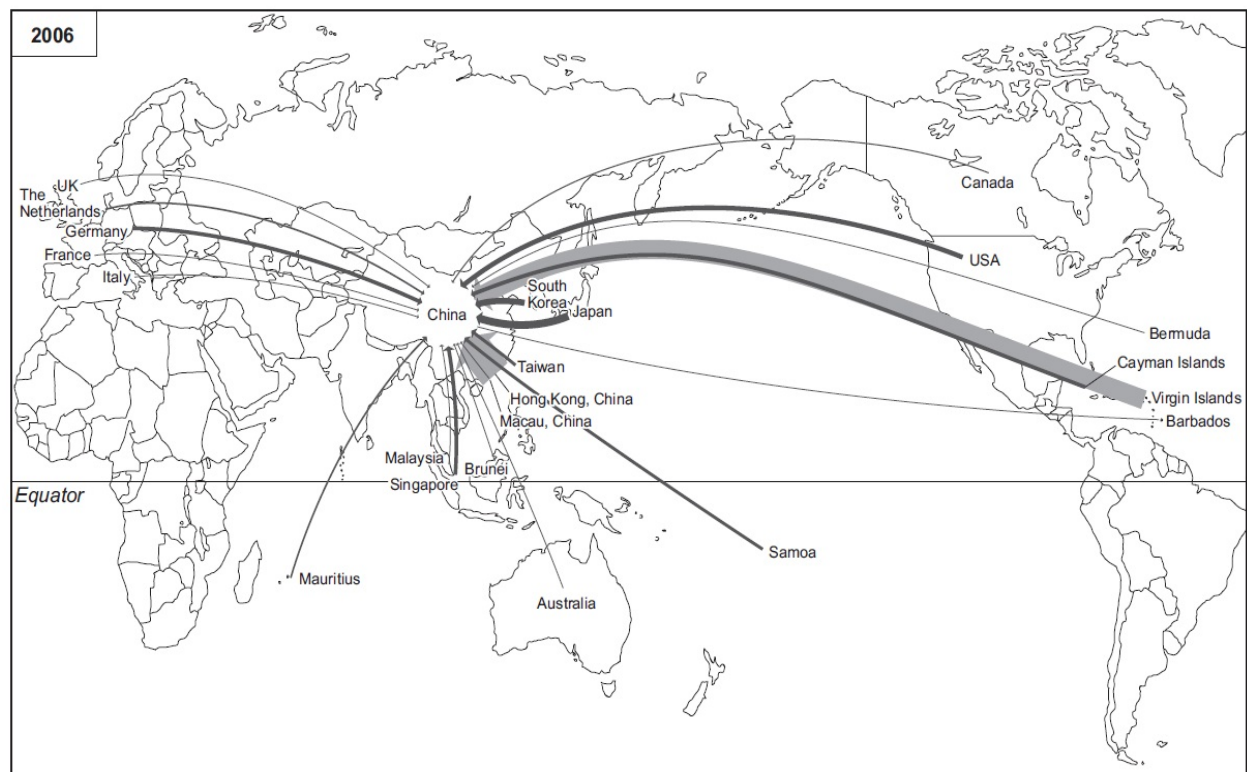
Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <http://www.ncdc.noaa.gov/sotc>



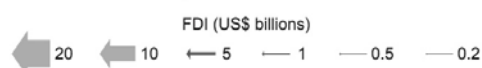
Resource 8A for Question 3
Foreign direct investment (FDI) into China, 1992



Resource 8B for Question 3
Foreign direct investment (FDI) into China, 2006



Key for 1992 and 2006



Resource 9 for Question 3
Plan of the Gateway City Industrial Estate, Thailand, 2008



Key

* IEAT Industrial Estate Authority of Thailand

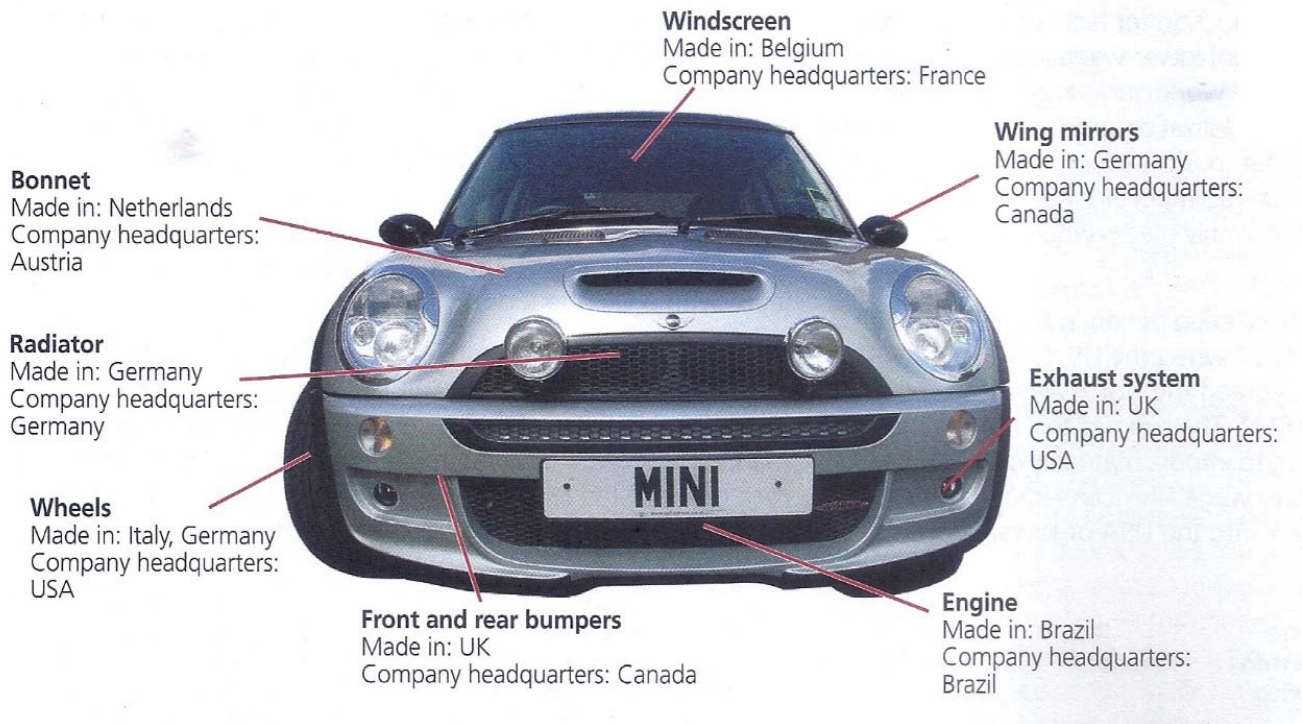
general industrial zone

export processing zone

other land-uses

road

0 250 500
m

Resource 10 for Question 3**BMW's Mini and the global production network that supports its construction**

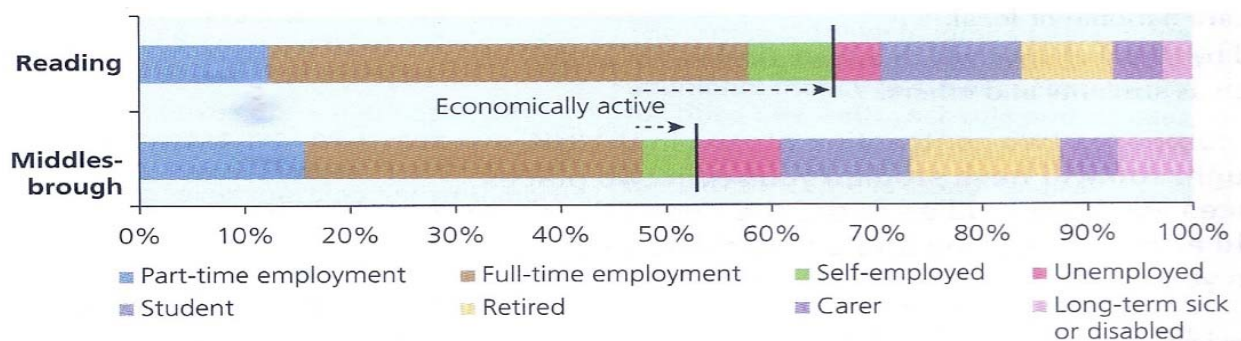
Resource 11 for Question 4
Locations of Reading and Middlesbrough in the UK



Resource 12 for Question 4
Employment in Reading and Middlesbrough in 2015

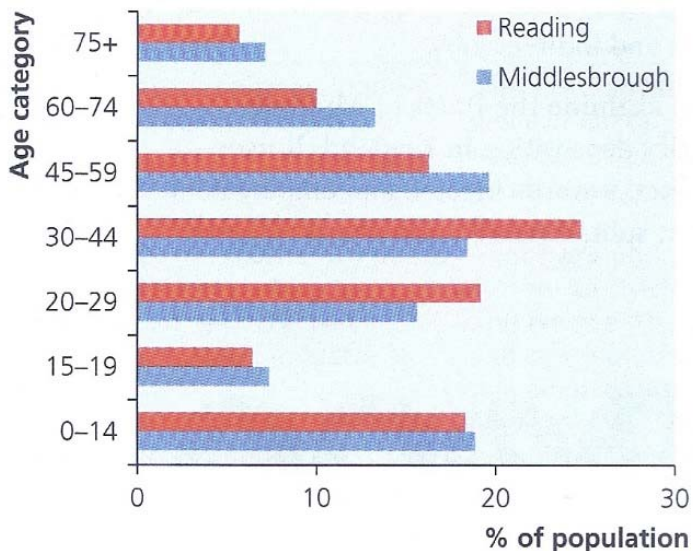
Pay and education	Percentage of people who are:	Reading	Middlesbrough
<div style="display: flex; align-items: center; justify-content: center;"> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> </div>	Management	9.2	7.5
	Professional (lawyers, doctors)	28.7	13.6
	Professional & technical	16.1	12.1
	Administrative	10.2	10.4
	Skilled trades	8.8	11.7
	Caring, leisure & other services	7.6	12.2
	Sales & customer services	5.3	8.1
	Process plant & machine operators	4.5	6.7
	Manual work	9.6	16.7

Resource 13 for Question 4
Economic activity in Middlesbrough and Reading in 2015



Resource 14 for Question 4

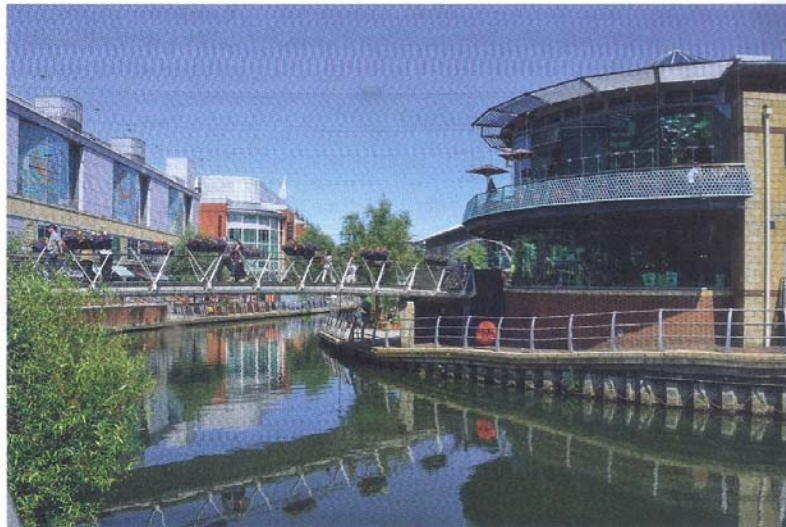
The age profile and population change of Reading and Middlesbrough in 2011



	1991	2011
Reading's Population	136,000	155,000
Middlesbrough's Population	146,000	138,400

Resource 15 for Question 4

Images of Reading (top) and Middlesbrough (bottom)



Resource 16 for Question 4
National wellbeing survey results 2015

How do you feel about:	Low/Medium		High/Very high	
	Middlesbrough	Reading	Middlesbrough	Reading
Life satisfaction	24%	17%	76%	83%
Life is worthwhile	20%	15%	80%	85%
Happiness	29%	23%	71%	77%

Resource 17 for Question 4
Rural and urban destination logos

		
<p>Malton in Yorkshire is marketed as a food town.</p>	<p>Rural Scotland markets its landscape and wildlife.</p>	<p>Hartlepool stresses its maritime heritage as a historic port.</p>

