

- (a) (i) State the height of the land shown by the spot height at Potter Heigham.

3 metres [1]

- (ii) State the direction of Eccles on Sea GR 4029 from Winterton-on-Sea GR 4919.

North West [1]

- (iii) State the straight line distance from the parking at Winterton-on-Sea GR 498198 to the parking at Sea Palling GR 427274.

Award [1]  
10.1–10.19 or 10.41–10.5 km

Award [2]  
10.2–10.4 km [2]

- (iv) Blood Hills wind farm (GR 4719) is located 1.5 km west of the popular seaside resort of Winterton-on-Sea (GR 4919). Suggest how the wind farm owners and the local tourist board might be in conflict.

Award [1] for an answer which addresses only one viewpoint, e.g. The tourist board might feel fewer visitors would visit the area.

Award [2] for an answer which briefly addresses both viewpoints (or one viewpoint with development of reason) of the conflict, e.g. The wind farm owners want to promote clean energy but the tourist board would feel that the wind farm would discourage visitors.

Award [3] for an answer which presents both viewpoints with elaboration, e.g. The tourist board might feel that potential visitors would be discouraged from visiting the area because the wind turbines are unattractive and spoil the scenic appearance of the landscape. This would lead to a drop in revenue from tourism affecting local businesses. On the other hand the wind farm owners would want to make money from their business and feel that the wind farm produces non-polluting energy and does not interfere with other land uses. [3]

- (v) Winterton-on-Sea has a wide sandy beach. Explain how a beach like this was formed.

Award [0] for a response not worthy of credit.

**Level 1 ([1])**

A limited explanation which makes reference to a beach being a depositional feature or formed by constructive waves, e.g. A beach is formed by deposition or a beach is formed by constructive waves.

**Level 2 ([2]–[3])**

An explanation which makes clear reference to a beach being formed by deposition by constructive waves, e.g. a sandy beach is formed by constructive waves depositing sand on a coastline [2] or a sandy beach is formed by constructive waves with a strong swash and a weak backwash depositing sand on a coast. [3] [3]

**Level 3 ([4])**

A thorough explanation which covers the processes involved in forming a beach and the nature of the beach or its location.

e.g. A sandy beach is formed by deposition in the inter-tidal area between high and low tide where sand is pushed onto the beach by constructive waves. Over time this material can build up and be blown inshore by wind to form a beach. On sandy beaches the backwash of the waves removes material forming a gently sloping beach.

N.B. Credit to level 3 fully developed answers relating to longshore drift which highlight the process and explain that the material may have originated somewhere else. This response acceptable for this question as the coastline has groyne revealing the operation of longshore drift.

[4]

(b) It has been stated that 15km of sea defences between Eccles-on-Sea (GR 4029) and Winterton-on-Sea (GR 4919) will not be sustainable in 50 years time.

(i) State the number of villages that will be lost if the area is flooded.

6 villages [1]

(ii) Using the Ordnance Survey map, name two sea defences used along this stretch of coastline.

Reefs, Sea walls or Groynes or Rocks  
(2 × [1]) [2]

(iii) Suggest one reason why planners would suggest the area should be allowed to flood and suggest why the public could object.

Award [1] for an answer which addresses only one viewpoint, e.g. The planners might feel the area should be allowed to flood as it will be too expensive to defend.

Award [2] for an answer which briefly addresses both aspects of the conflict but in limited detail or in a general manner, e.g. The planners might feel that the area should be allowed to flood as it will be too expensive to defend but the public would object as their homes will be destroyed.

Award [3] for an answer which addresses both viewpoints with elaboration, e.g. The planners might feel that it would be too expensive to defend this large area of coastline (in a sustainable manner) as it is very low lying and sea defences such as a sea wall would be costly to maintain. Meanwhile local people would object as 6 villages and 5 medieval churches will be lost forever along with 4 natural freshwater habitats. They would consider that the money should be spent to protect the natural and human environment. [3]

1 (a) (i) Complete the key for Fig. 1 in Table 1.

Key
Watershed
Precipitation or rainfall
Throughflow, groundwater flow or percolation – Do not credit infiltration
Tributary (given)

(3 × [1]) [3]

(ii) Describe one transfer by which rainwater reaches the river in any drainage basin.

Award [1] for a brief statement,  
e.g. The rain falls on the ground, flows over it to the river/surface runoff.

Award [2] for a statement which uses accurate terms to describe the transfer,  
e.g. The rain falls onto the ground, sinks into the soil and flows as throughflow into the river,  
e.g. The rain falls onto the ground, sinks through the soil and into the rock and flows through the rock to the river as groundwater flow,  
e.g. surface runoff is when the rainwater runs over the ground into the river. [2]

(b) Using Fig. 2 to help you, explain the formation of a waterfall.

**Level 1 ([1])**

Brief accurate statements,

e.g. The hard rock makes a waterfall/the river runs over a hard rock and drops down/the soft rock is eroded/the water falls into a pool.

**Level 2 ([2]–[3])**

Accurate reasons relating to undercutting of the hard rock and the fall of water into a plunge pool,

e.g. There is a layer of hard rock over a layer of softer rock and the softer rock is more easily eroded so the hard rock is undercut and a step is formed by the processes of erosion. The river falls into a plunge pool and the hard rock overhangs this pool.

**Level 3 ([4]–[5])**

Accurate reasons with use of accurate geographical terms, e.g. processes of erosion and links to the collapse of the overhang and the retreat of the waterfall,

e.g. There is a layer of hard rock over a layer of softer rock which is more easily eroded so the hard rock is undercut; a step is formed by erosion processes of abrasion (corrasion) and hydraulic action; the river falls into a plunge pool, and the overhanging hard rock eventually collapses due to this undercutting and so the waterfall retreats backwards/upstream. [5]

- (c) (i) Describe and explain how the river load changes downstream.

For Level 3 there should be good descriptions of both size and shape, with figures and descriptions of shape quoted, clear explanations and references to processes of attrition and abrasion/corrasion.

**Level 1 ([1]–[2])**

Brief statements with focus on description or explanation only with no figures or shapes quoted from the table,  
e.g. The stones/pebbles are eroded and become smaller.

**Level 2 ([3]–[5])**

Statements of description with some use made of figures and shapes from table provided and some explanation or very detailed description/ explanation for both shape and size for bottom Level 2. Good description but no figures and excellent explanation for top Level 2.  
e.g. The stones are larger at site 1, average size is 150 mm or 135 mm at site 2 and become smaller downstream because they bump into each other and hit off the channel beds and banks; they become more rounded downstream, changing from angular at site 1 to well-rounded at site 7 because the sharp edges have been knocked off. Mention of either shape or size and mention of process for bottom Level 2. Both processes mentioned but no explanation of these and good explanation for top Level 2 or only 1 process and definition outlined with good description for top Level 2.

**Level 3 ([6]–[7])**

Good description with figures and shapes described and detailed processes (with names of terms accurately used for top Level 3),  
e.g. The stones and pebbles become smaller and more rounded downstream. They change from large rocks of 150 mm to smaller stones of 31 mm at site 7. They change from angular shapes at sites 1, 2 and 3 to more rounded or well-rounded by site 7. The reasons for the decrease in size are that the stones and pebbles are eroded by hitting off each other and bouncing against the bed and banks so they break up; this process is called attrition. The load becomes more rounded because as pebbles and stones bang into each other their sharp edges are knocked off. The load becomes more smooth as it hits off the bed and banks as the river uses its load to abrade the bed and banks through the process of corrasion. [7]

through the process of corrasion.

[7]

- (ii) Suggest one reason how this stone came to be at this site.

Award [0] for a response not worthy of credit geographically, e.g. rock was thrown into river.

Award [1] for a simple valid suggestion,  
e.g. The large stone may have just fallen into the river.  
e.g. The large stone may be made of very hard rock.

Award [2] for a more detailed valid reason,  
e.g. The large stone may have just fallen into the river as it has just been removed from the banks at site 5 and so has not had time to be eroded yet.  
e.g. The stone may well have been carried down the river during times of flood and therefore could be much larger than expected at this site. [2]

- (d) Explain fully one human cause of flooding on a river in the British Isles which you have studied.

Award [1] for a brief accurate human cause (if physical cause is fully described – maximum Level 1, no named river max. Level 1)  
 e.g. More building of houses, etc. on the floodplain.  
 e.g. Deforestation or peat cutting on the hills.

Award [2] for an accurate human cause with explanation,  
 e.g. Peat was removed and so its sponge effect was lost; this meant the soil could not hold all the rain and it travelled quickly onto the floodplain causing the River Derwent to burst its banks.

Award [3] for an accurate human cause explained and elaborated with a fact/figure/place related to named river,  
 e.g. On the River Derwent in 1999, peat was cut on the North York Moors and so its sponge effect was removed; this meant the soil lost its capacity to hold all the rain and it travelled quickly onto the floodplain causing the River Derwent to burst its banks and flood towns. [3]

- (e) (i) Draw arrows to show whether the impacts of flooding affect people or the environment.

People	Impact	Environment
←	Floods can spread diseases in stagnant water	
←	Roads and railways washed away	
← (given)	Floods provide fertile farmland for farmers to grow crops	
	Wild animals may drown	→

(3 × [1]) [3]

- (ii) Compare the sustainability of one hard and one soft engineering strategy. If candidate discusses two hard engineering or soft – can still achieve top Level 3.  
 e.g. The Mississippi.

**Level 1 ([1]–[2])**

Brief accurate statements which may deal with only one type of strategy, good answers about a river in the British Isles or answers without a named river are limited to Level 1,  
 e.g. Levees were used to prevent floods but did not work.  
 e.g. Levees were used to prevent floods but they were breached in 2001.

**Level 2 ([3]–[5])**

Accurate statements relating to the sustainability of both types of strategy. Two strategies well discussed with up to 1 fact/figure for top Level 2 maximum,  
 e.g. Levees are a hard engineering strategy but they failed in 2001 as the river level rose higher than 15m so they are not sustainable when river levels rise very high; trees were planted as soft engineering and they intercept rain but take a long time to grow. [4]

**Level 3 ([6]–[7])**

Accurate comparison of the two types of strategy with facts/figures/ places relating to both strategies and good discussion of sustainability. One fact/figure for both strategies for top Level 3. If candidate gives two facts/figures for one strategy but no fact/figures for the second maximum bottom Level 3.  
 e.g. Levees are a hard engineering strategy which help to keep rising water levels in the river channel, but they failed in 2001 as the river level rose higher than 15m; they were not sustainable in the long term as the river bed rose due to silt being deposited. Trees were planted in the Tennessee Valley as a soft engineering strategy to reduce flooding by increasing the interception of rain, but they take a long time to grow and may not help to protect important cities on the floodplain such as St Louis. [7]



2 (a) (i) Name the weather element which this instrument measures.

Wind speed. Do not accept wind on its own. [1]

(ii) Explain how this instrument records the weather element.

Award [0] for a response not worthy of credit.

Award [1] for a simple statement,  
e.g. The cups spin around.

Award [2] for a statement with a consequence,  
e.g. This instrument is placed in the air, the cups catch the wind and spin around.

Award [3] for a statement, consequence and elaboration on either  
a – placed high/in open  
b – method of recording  
c – detail of device,  
e.g. The cups on the anemometer catch the wind and spin around. The reading is displayed on the instrument in knots/mph. [3]

(b) (i) State the distance between weather buoys D and E.

145 km–155 km. [1]

(ii) List **three** sources of data other than weather buoys which can be used to create a weather forecast.

Any **three** from:  
land based stations, balloons, weather ships, satellites.  
Credit both if named – Geostationary/Polar.  
Do **not** credit measuring instruments.

(3 × [1]) [3]

(c) (i) Complete Table 3.

Weather conditions
2(°C)
Clear sky or 0/8 or 0 oktas
1–2 knots (must include unit)
Westerly or West
1032 mb (must include unit)

(5 × [1])

[5]

- (ii) Explain the following weather conditions experienced in a winter anticyclone.

Award [0] for a response not worthy of credit.  
Credit valid alternative reasons.  
Several simple statements, award up to Level 2.  
No marks awarded for stating weather conditions.

**Low temperatures**

Award [1] for a simple statement,  
e.g. The days are short/influenced by a polar continental air mass/low angled sun or radiation heat loss.

Award [2] for a statement with a consequence,  
e.g. The days are short so there is little time to heat the ground.

Award [3] for a statement, consequence and elaboration,  
e.g. The days are short so there is little time to heat the ground, which in turn, heats the air. [3]

**Absence of cloud cover**

Award [1] for a simple statement,  
e.g. Air is sinking in an anticyclone.

Award [2] for a statement with a consequence,  
e.g. Air is sinking in an anticyclone. As the air is warming up, clouds cannot develop.

Award [3] for a statement, consequence and elaboration,  
e.g. Air is sinking in an anticyclone. As the air sinks it is warming up, so therefore clouds cannot develop. Condensation is prevented from happening so water droplets cannot develop and form clouds. [3]

- (d) Award [0] for a response not worthy of credit. If no named city – max. Level 1

**Level 1 ([1]–[2])**

A simple accurate statement referring to either investing in public transport and/or congestion charging as ways to deal with climate change,  
e.g. Congestion charging may stop people taking their cars into towns and cities. [1]  
e.g. Congestion charging may stop people taking their cars into towns and cities; public transport such as buses and trams can help cut down the number of cars on the road. [2]

Candidates present some relevant information in a form and using a style of writing which suits its purpose. The text is reasonably legible. Spelling, punctuation and the rules of grammar are used with some accuracy so that meaning is reasonably clear. A limited range of specialist terms is used appropriately.



#### Level 2 ([3]–[4])

A statement with a consequence which refers to two strategies affecting car use as ways to deal with climate change. Award top Level 2 if one strategy fully explained. No clear link to climate change for max. top Level 2, e.g. Congestion charging may stop people taking their cars into towns and cities, whereas public transport such as buses and trams can help cut down the number of cars on the road. This is good as it cuts down on the levels of greenhouse gases that are responsible for global warming. [3]  
e.g. Congestion charging is the paying of money when you drive into a city. This had the effect of reducing the number of people taking their cars into towns and cities as people do not want to pay high charges; public transport such as buses and trams can help cut down the number of cars on the road. This is good as it cuts down on the levels of greenhouse gases that are emitted into the atmosphere that are responsible for global warming. [4]

Candidates present relevant information in a form and using a style of writing which suits its purpose. The text is legible. Spelling, punctuation and the rules of grammar are used with considerable accuracy so that meaning is clear. A good range of specialist terms is used appropriately.

#### Level 3 ([5]–[6])

Detailed statements with consequences which refer to two strategies affecting car use as ways to deal with climate change. **At least one city needs to be stated** with specific fact/figures for Level 3. At least two facts/figures for top Level 3. Level 3 needs a clear link to climate change, e.g. Congestion charging was introduced in London in 2007. Drivers pay £8 each time they enter the city. This had the effect of reducing the number of people taking their cars into London by 15%. Public transport such as buses and trams can help cut down the number of cars on the road. This is good as it cuts down on the levels of greenhouse gases, such as nitrous oxide, emitted into the atmosphere that are responsible for global warming.

Candidates present, and organise effectively, relevant information in a form and style of writing which suits its purpose. The text is fluent and legible. Spelling, punctuation and the rules of grammar are used with almost faultless accuracy so that meaning is clear. A wide range of specialist terms is used skilfully and with precision. [6]

- (a) (i) Underline the percentage of people aged 0–4 in Peterborough in 2009.

3.9 %     7.6%     13.7%     [1]

- (ii) Describe the differences between the shape of the population pyramid for Peterborough and the pyramid shape for England as shown on Fig.1.

Award [0] for a response not worthy of credit.

**Level 1 ([1])**

A statement about Peterborough's pyramid or a basic difference with a lack of detail,  
e.g. Peterborough has lots of children.  
e.g. Peterborough's pyramid has a wider base.

**Level 2 ([2]–[3])**

Two differences which include at least one figure or reference to specific cohort(s) [3]. One difference may be described in more detail than the other,  
e.g. Peterborough's pyramid has a wider bulge in the 20–44 age group while England has more people in all age groups above 50 years.  
e.g. Peterborough's pyramid has a wider base than England's as almost 8% of the population is aged 0–4. It also has more people aged 25–44.

**Level 3 ([4]–[5])**

Comparisons made highlighting Peterborough's larger percentage in the 25–44 age group, England's larger population in the older age groups and Peterborough's high numbers ages 0–4. At least two figures should be quoted from different cohorts for [5]. Shape ref needed for [5].  
e.g. Peterborough has a larger percentage of people in the 20–44 age groups as shown by the bulge beyond the line showing the shape for England. Almost 8% of the population is aged 0–4 compared to England which has just over 6% in this category. However, England has a population showing greater aging than Peterborough's as the line of its pyramid is beyond the extent of all bars over 50 years. [5]

- (b) (i) State the meaning of the term **natural increase**.

Award [1] for a partial definition.  
e.g. A large number of babies being born.

Award [2] for a full definition which refers to the increase of birth rates over death rates.  
e.g. The positive difference between the birth rate and the death rate. [2]

- (ii) Describe two possible impacts for cities such as Peterborough experiencing migration patterns similar to those shown in Table 1.

Positive or negative impacts are acceptable.

Award [0] for an answer not worthy of credit.

**Level 1 ([1])**

A simply stated impact which relates to the increase in population due to migration.

e.g. Large numbers of immigrants in cities puts pressure on services.  
e.g. Vacancies in the job market can be filled.

**Level 2 ([2]–[3])**

Two impacts stated, one with more elaboration,  
e.g. The migrants are often willing to do jobs that the local people do not want to do.

e.g. Cities receiving large numbers of immigrants from countries in Eastern Europe have to pay for additional services, for example interpreters in schools.

**Level 3 ([4])**

Two well developed impacts which include a statement and a consequence.

e.g. Cities receiving large numbers of immigrants from countries in Eastern Europe have to pay for additional services, for example interpreters in schools and this costs a lot of money which has to be paid for from taxes.

e.g. However, the migrants are often willing to do jobs that the local people do not want to do, providing services and boosting the economy. [4]

- (a) (i) Using Fig. 1, describe the global distribution of cities which have over 25% of their population made up from international immigrants.

Award [0] for a response not worthy of credit.

**Level 1 ([1])**

A limited description of the distribution of settlements as shown in Fig. 1.

e.g. Most of these cities are on the coast. [1]  
or a full list of named cities with no ref to global distribution [1]

**Level 2 ([2]–[3])**

A more detailed description of the distribution of settlements as shown in Fig 1. This may take the form of a simple list which counts the number of such cities in different regions.

e.g. North America and the Middle East have the most such cities with 7 [2]

e.g. Many are in the (Northern Hemisphere and have coastal locations.)

North America and the Middle East have 7 cities each with 25% or more international immigrants but Europe has only 4 cities [3]

A good attempt at a global pattern without values [2]

A good attempt at global pattern with a value [3]

**Level 3 ([4]–[5])**

A detailed description of the distribution of settlements as shown in Fig. 1 – for top level 3 the candidate should contrast areas with and without such settlements.

e.g. The cities shown on Fig. 1 are not evenly distributed around the world. Many are in the Northern Hemisphere and have coastal locations. North America and the Middle East have 7 cities each with 25% or more international immigrants. Europe has 4 such cities, including London. [4] Some continents like South America and Africa have no cities with over 25% international immigrants. [5] [5]

(ii) State two pull factors which might attract migrants to cities

It is expected that answers will focus on aspects such as good job opportunities, better schools, better access to hospital care, to be closer to family if a husband/brother has gone before the rest of the family, etc. Award [1] for each correct pull factor up to a max of [2].  
e.g. Cities offer migrants more jobs [1] and better health care [2].  
(2 × [1]) [2]

(b) Evaluate the impacts of international migration to a country you have studied within the European Union.

Responses may relate to either a receiving or sending country, either are valid. Impacts must relate to a country within the EU. The impacts must be national, not personal to the migrant. Candidates are likely to classify as social/economic or positive/negative. In order to achieve [6] a concluding statement on the overall effects of the migration is needed.

Social impacts may include pressure on services such as schools and hospitals; many more houses will be needed. Migrants bring aspects of their culture such as food which enrich local communities.

Economic impacts may include a willingness to do either low-paid work or fill skilled gaps in the labour market. They pay taxes which helps maintain levels of public services. The increased demand for housing may create jobs but can lead to rises in house prices.  
Award [0] for a response not worthy of credit. If discuss immigration into city only award Max Level 1

**Level 1 ([1]–[2])**

A superficial answer which simply makes general statements that could apply to any country. There is little attempt to make a meaningful evaluation, e.g. In the UK many migrants take up jobs [1] but put pressure on schools [2].

**Level 2 ([3]–[5])**

An answer that clearly describes the impacts of international migration for a specific country in the EU but which lacks case study detail and may only have a superficial evaluative element, e.g. In the UK immigrants can cause tension with locals and put pressure on schools because English might be their second language. However, they may make a positive impact when they introduce new cultures and food like Chinese take-aways. [5]

**Level 3 ([6]–[7])**

A balanced answer that clearly addresses the question by elaborating on both positive and negative impacts for a specific country in the EU. An evaluative statement on whether the impacts are overall good or bad/ economic or social is needed for [7]  
e.g. In the UK immigrants can cause tension with locals and put pressure on schools, but they may introduce new cultures and food like Chinese take-aways. They made up 13% of the British workforce in 2010, often filling gaps in the labour market within the NHS and can benefit the economy by paying taxes if they work. In fact in the UK government estimates that by paying taxes migrants add between 30 and 40 billion pounds each year to our economy. It seems then that international migration is beneficial to the UK. [7] Accept other valid alternative answers. [7]