

GCE

Geography

Unit 3 Contemporary Geographical Issues (GEOG3)
Exemplar Script 4

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Option 2 Weather and Climate and Associated Hazards**Total for this option: 25 marks****04**Study **Figure 2**, a photograph taken early on a calm summer morning in England.

Comment on the atmospheric conditions shown.

(7 marks)**Candidate's Answer**

The photograph shows a valley, which is quite misty. Fog is associated with anticyclonic weather. The tops of the slopes cool faster and the cool air sinks forcing the warm air up and out of the valley. The air in the valley condenses to its dew point and becomes fog which becomes trapped under a small temperature inversion. The skies in the photo are also clear, with just a small amount of stratus cloud cover (wispy clouds) This also suggests that there is anticyclonic weather as this produces clear skies or some low level cloud. **[Linkage of 3 characteristics to an anticyclone - mist, clear skies and wispy clouds, so Level 2 awarded. There is some confusion regarding stratus cloud, and fog, but enough is creditworthy with references to temperature inversions and sinking air]**

There are hot air balloons in the picture. This suggests that it is not very windy because they would get blown off course and it would be dangerous. Therefore, there is quite a small pressure gradient. **[Comment regarding wind]** The balloons are over a rural area which suggests that the weather is not very hot, as there is no urban heat island effect.

There must also be thermal currents of warmer air as this is what hot air balloons need to function. The advection fog is the main evidence to the conditions. **[Incorrect]**

The sky is hazy and there is a slight orange glow over the hills. Fog in summer tends to occur in the morning. This could be due to pollutants trapped in a temperature inversion. **[Haze has already been credited. There is no fog in the photo]**

The people in the houses will be sitting outside in the warm because the sun is out and it looks like it will be a lovely and (Fig 1.0 - diagram below). Because the sun is out the fog is likely to burn off, however, because it is calm, there is no wind **[rep]** and it is likely to take longer to dispense than usual. There is likely to be quite high pressure on the ground due to sinking air **[rep]** caused by the anticyclonic conditions. High pressure means there might be some rain once the air reaches condensation point. **[Incorrect]**

[Two comments - mid Level 2 - 6 marks. There is a lot of confusing statements in this answer, but some creditworthy ones. The diagram below does not add anything]



05

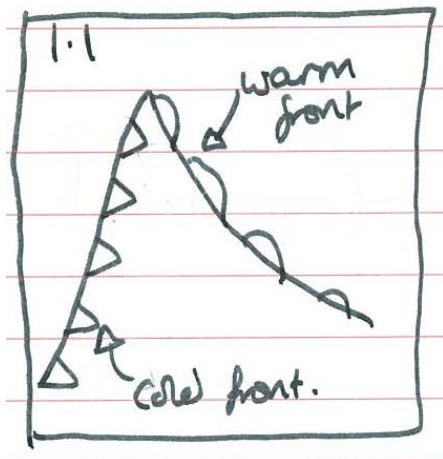
Outline the origin of depressions affecting the British Isles.

(8 marks)

Candidate's Answer

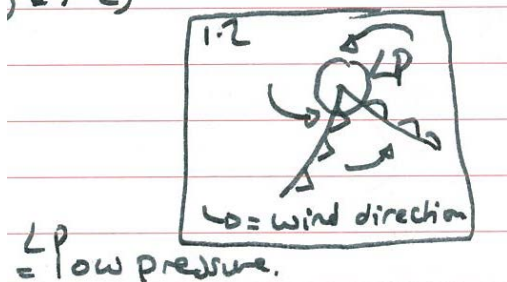
Depressions that affect the British Isles usually originate in the Bay of Biscay. Cold polar maritime (an air mass from the North West) air meets warmer South westerly Tropical maritime air. The cool air is more dense and so forces the warm air to rise above it. This creates an area of low pressure at the surface.

[Detailed statement of origin - meeting of 2 air masses, relative densities and creation of low pressure. Level 2 awarded] It is represented on a weather map by closed isobars with the pressure decreasing towards the centre. The central pressure of a depression is usually less than 1000mb (millibars, the unit of pressure). The coriolis force is a force resulting from the fact that the earth is spinning on its axis. The coriolis force deflects winds (+ air masses). It is the coriolis force that makes a depression wave because the air masses are affected by it. **[Method not made clear]** The wave developed into a warm and a cold front (see diagram 1.1).

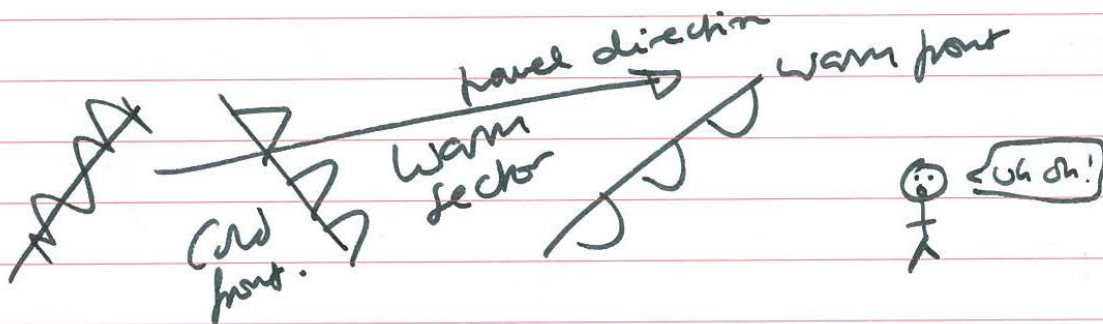
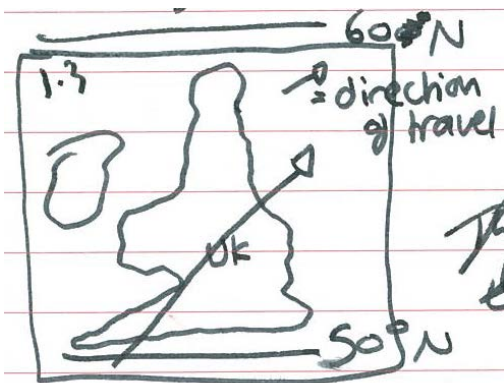


The warm front is pushed by the cold air from behind. The depressional winds spiral in towards the low pressure centre (fig 1.2)

) (1.2)



Because they form in the Bay of Biscay depressions that cross the UK travel across from the South West to the North East (1.3). The Bay of Biscay is to the South of England.



The UK has quite a lot of depressions because of its mid latitude position (1.3) and unstable air.
[The rest of this answer is largely descriptive. Diagrams do not add anything. One Level 2 statement - 5 marks]

06

With reference to **one** storm event in the British Isles that you have studied, discuss the impact of, and responses to, storm events. (10 marks)

Candidate's Answer

One storm event in the British Isles was the 1987 (15/16 Oct) "Great Storm". There were many impacts and responses. **[Clear identification of storm event]**

The storm had devastating impacts on the British Isles. It originated in the Bay of Biscay and was predicted to travel over France and Spain. However, it veered north and because there was therefore no warning, there was a big impact. Firstly, the environmental impact was appalling. Many trees were uprooted; 15 million in total. This was because a lot of the trees hadn't dropped their leaves yet so the strong 150 kph winds had a big impact. It was such a problem because lots of the trees that were killed were in places like Kew gardens. Many of these trees were rare species or ones that had been found abroad by researchers and were the only ones of their kind in the country. It was estimated that it would take 20 years to start finishing and have the trees regrown again. **[Some discussion of specific environmental impacts]** Furthermore, there were social impacts. The storm killed 19 people. Most of them were in the South East of England where the storm first hit. Several of these people were victims of their cars being crushed by one of the 15 million downed trees. However, 2 of them were firefighters involved in the rescue effort. There was also a loss of electricity to 20,000 houses and the telephone lines were blown down. This made the rescue effort much more difficult. Furthermore, the ambulances couldn't (and were advised not to try) get to work. This meant a loss of working hours for many companies. **[Some discussion of social impacts]** Furthermore, the storm event cost the insurance companies about £2 billion. The cost to the NHS was also high as the hospitals were inundated with people who had been injured. **[Several Level 2 statements of impacts]**

There were several important responses to the storm event. Some were good, and well carried out and some were criticised. **[Weak discussion points]**

Firstly, the government of the UK was criticised for not having a plan in place to deal with the event and its effects. However, this is seen by many to be an unfair criticism of the Thatcher government because such big storm events are so very rare over the British Isles. It wouldn't be practical to have a plan in place. Furthermore, a public response to the earthquake **[earthquake?]** was anger at the forecasters. Michael Fish had gone on the news to say there wouldn't be a hurricane (the remnants of Hurricane Floyd in America) and that the storm would go over Spain. Again, this is a bit of an unfair criticism as he could never have predicted the sudden veer northwards. He had been made a scapegoat. **[This has little to do with responses, being largely about prediction]** Another poor response was that it took several weeks to restore all the power and water supplies. People complained because they were so long without power. There was just such a massive scale of damage that it couldn't really have been done any faster. Furthermore, the insurance companies were criticised because they tried to get out of paying money by saying it was an 'act of god' etc. **[Generic statements of response]**

In general, the response to the great storm was good. At a local level, farms that were able used their tractors to start shifting trees to allow the emergency services through. Local farmers were a key part of the response. Furthermore, local people found out who was injured and helped alert the emergency services and offered temporary accommodation to people whose houses had been damaged. **[More general responses]**

Overall, the impacts of the storm were very bad for a UK event, but not bad when considered against the effects of (for example) Hurricane Katrina in America. The responses at local level were very good, but the government was criticised.

[Specific and detailed statement of impacts, with some discussion. Statements regarding responses are more general with some irrelevant material. Overall Top Level 2 - 8 marks]

Option 4 World Cities**Total for this option: 25 marks**

- 1 0** Study **Figure 4** which provides elements of the Traffic and Transportation Policy in the city of Freiburg, Germany (October, 2008). Comment on its development as an integrated, efficient and sustainable transport system. (7 marks)

Candidate's Answer

*The rail system of the area has been improved, because 65% live in its catchment area, it allows a large proportion of the population access to public transport which is more sustainable than private transport. There is still 35% of the population however that do not have access to the tram system, therefore it is not available to all and these may still need to use private transport. Also, because it has 500km of bike paths it shows they are committed to making cycling a viable option, this is good because bikes produce no CO₂ so the city will be cleaner. **[Clear comment re sustainability]***

Because most of the area is 30 mph it is likely to flow better and therefore be more efficient it is also safer. The transport system is integrated as its rail system links the city to the region.

[Brief statements that do not merit any further credit]

[One comment made - Level 2, 5 marks]

- 1 1** Outline characteristic strategies of waste management in urban areas.

(8 marks)

Candidate's Answer

*One major part of waste management is to reduce the waste produced to start with. The UK is attempting to do this as they have a plan to reduce the volume of household waste by 10% by 2015. Ireland also has a policy that plastic bags cost €0.15 each to encourage people not to throw them away, this has been very successful. **[First strategy, plus brief example]***

*Another strategy is to encourage people to reuse items. The most successful example of this is the bag for life scheme. Some countries also charge deposits on glass bottles to encourage their return. Recovery is another strategy and is often known as recycling however this has had limited success in the UK. This is mainly because people see recycling as a waste of time and it is seen as a middle class way to save the world. Even though glass is 100% recyclable, only 20% is recycled in the UK. **[Generic strategies]** Strategies such as the introduction of different coloured recycling bins have helped in Warrington where this is introduced. Recycling rates are 40% compared to a national average of 25%. **[More specific detail of a named scheme]** A final strategy is to dispose of what is left. This is often done by landfill however in 2006 the UK only had room for 9 more years of landfill. The aim of the above strategies is to minimise the waste that needs to be disposed of. Incineration is another alternative however this can produce harmful gases. **[A range of strategies, plus two brief case studies. Mid-Level 2 - 6 marks]***

- 1 2 Evaluate the success of **one or more** partnership scheme(s) in the regeneration of urban areas. (10 marks)

Candidate's Answer

*An example of a partnership scheme is the Rope Walks partnership scheme in Liverpool. **[Clear identification of a scheme]** This concerned the area round Bold street and had a number of aims. One of these was to improve the physical environment. This was achieved as £20 million was spent on the regeneration of Bridgewell and Campbell Squares. They also aimed to increase private sector investment and 3 companies including Urban Splash purchased £70 million worth of property in the area. They also sought to provide work and training opportunities. **[Detail of scheme]** I believe this was achieved because 815 jobs were created and a community college was built in the area. **[Statements of evaluation]** Two aims that went hand in hand were the restoration of many of the 70 listed building in the area and supplying housing. Buildings such as the old cinnamon warehouse were bought and converted to apartments. The area was also turned into a hub of nightlife with a number of bars, nightclubs and cinemas built. **[More statements of success that apply to the named area - though the last sentence is generic]***

Overall I think Rope Walks was very successful as it not only tackled the physical problems of the area but also the social ones. Unemployment was reduced because of the influx of jobs and also because of the college. Affordable housing for local people was supplied and it was made a more attractive place to live through the redevelopment of previously derelict buildings. The only downside is that the introduction of bars and clubs may bring with it drunken crime.

[A range of explicit statements of evaluation]

[Clear detail of the partnership scheme, together with specific and explicit evaluation. Some statements are generic. Low Level 3 - 9 marks]

Candidate's Answer**Option 1 Plate Tectonics and Associated Hazards**

- 1 9 Evaluate how plate tectonics theory helps our understanding of the distribution of seismic and volcanic events. (40 marks)

Candidate's Answer

The theory of plate tectonics is a relatively new idea – only conceived and developed within the last 100 years and is now generally accepted as the explanation for the causation of earthquakes and volcanoes and where they occur. It has now replaced the theory that tectonic events are caused by god in most western countries. [A brief introduction that sets the scene]

The theory of plate tectonics was first developed by Alfred Wegener in 1912. He saw that the continents seem to have a jig-saw fit eg Africa and South America coastlines fitting together, suggesting that they were at one time joined together as part of a super continent called Gondwanaland and the other super continent Laurasia was in the north. Later evidence supported this – the fossilised remains of a dinosaur, the mesosaurus, was found on the coasts of Brazil and Gabon. There were also the same fossilised pollen species and rock sediments on these coastlines. [Strong knowledge (K), together with evidence of synopticity in the latter two sentences]

Wegener's ideas, though simple, [first sign of critical understanding (c/u)] were proved further right and built upon which further increased our understanding of tectonic events. Sea floor spreading was discovered showing that rock is being created and destroyed, leading us to believe in the existence of plates and plate boundaries. Sea floor spreading was shown in the Atlantic, where it is believed the Eurasian and North American plates are moving apart, at what is called a constructive plate boundary. Here magma rises through a rift and cools rapidly on the surface creating new plate material and a ridge of volcanoes called the mid-Atlantic ridge. This has created Iceland which also contains rift valleys showing the plates are moving apart. The eruption of Surtsey in 1963 created a new island which further proved that land and plate were being constructed along this margin. [More strong K and good use of example/case study] More modern technology has helped to prove this theory. Carbon dating of the oceanic crust has shown that the crust nearer to the UK is far older than crust along the mid-Atlantic ridge. [Synopticity] Deep sea exploration has discovered 'black smokers' and palaeomagnetism. Palaeomagnetism is where metallic elements in the crust are aligned in opposing layers. Every several 100000 years the poles flip – this means that every such time the metallic elements align themselves in the opposite direction ie facing the pole they are attracted to. This means that each band of the opposingly aligned elements in the crust represent several hundred thousand years of crust that was created in that time. All this evidence combined to prove sea floor spreading but this means if a plate is being created at one end, it must be being destroyed somewhere else. [Good K and evidence of c/u]

This was once again proven by deep sea exploration. Many earthquakes and volcanoes are found along the Pacific Ring of Fire. Running close by parallel to these boundaries were very deep ocean trenches eg the Marianas trench, which were the deepest parts of the ocean. Scientists realised that the ocean trenches showed that some plates are subducted – this being where they are destroyed. Here an oceanic plate which is denser would subduct a continental plate, the plate would melt inside the mantle creating a pool of magma which would rise through the cracks in the rock forming a volcano. This addition to the plate tectonic theory explained why volcanoes are always found along plate boundaries which are constructive – due to rising magma – and destructive – due to plate melting. [Good K, use of example, and clear link to Question (Qu)]

However plate boundaries are different **[c/u]**. Many earthquakes are distributed along the Eurasian/Indo-Australian plate boundary where there are no volcanoes. There are very high mountains here such as the Himalayas. The theory of plate tectonics explains that oceanic plates, because they are denser, always subduct continental plates. Here two continental plates meet – so scientists developed a theory that fold mountains were created. The two plates converge, neither subducts the other, they both push sediments up together creating very high fold mountains. Pressure builds and eventually the plates fault upwards, breaking and adding to the creation of the mountains so this explained the other way that plates could be destroyed – by fracturing. **[Strong K, and c/u]** The build up of pressure and sudden faulting explained why so many earthquakes occurred along this boundary, such as in Bam, Iran in 2003. The earthquakes found along destructive plate boundaries such as the Japan earthquake in 2011 were caused by a similar build up of pressure, because the subducting (Pacific) plate would ‘stick’ to the subducted (Eurasian) plate, pulling it down and then eventually releasing the ‘stuck’ plate creating an earthquake. **[Good use of examples]**

So the plate tectonic theory had explained why volcanoes and earthquakes were formed along so-called imaginary lines – because there were actually a variety of different plate boundaries. **[Clear link to Qu]** However there were some issues. The volcanoes of Hawaii and Yellowstone are found in the middle of plates (intra-plate) and so did not correlate with the idea that volcanoes were found along plate boundaries. **[Evidence of c/u]** However Tuzo Wilson was able to explain this with the Hawaiian hot spot theory. He said hot spots were formed by magma plumes in the mantle which created melting of the crust at a particular point forming a volcano. He stressed that the plume was stationary and the crust moved over it. This created a series of volcanoes called the Emperor sea mountain chain. The plume would create a volcano – the crust would move so the plume would no longer build a volcano there and would start a new one alongside. The old volcano would be eroded by wind and wave until it went under the sea creating a coral reef around it – eg the Midway Islands. Eventually the seamount would be destroyed at a destructive plate boundary near Russia. **[Strong K and good use of example]** So in fact the troubling issue of an intra-plate hot spot actually helped to prove plate movement and therefore the theory of plate tectonics. **[Strong c/u]**

Another issue was that there was evidence of volcanoes in areas away from plate boundaries. **[More c/u]** Examples include Arthur’s Seat in Edinburgh (an extinct volcano) and the Whin Sill dyke in northern England. But in fact these also proved plate tectonic theory because they showed temporal change ie they were once at plate boundaries but have move away because of plate movement. **[Strong synopticity]** All the evidence, sea floor spreading, hot spots and subduction proved the plates moved. The theory behind this was later developed: that convection currents in the mantle drove movement and slab pull at subduction zones drag the plate across the fairly liquid mantle. **[K and synopticity]**

The theory proved that there was a general correlation between earthquakes/volcanoes locations and their proximity to a plate boundary. **[Clear link to Q – a view being given]** However they only explain where tectonic events generally occur, not specifically plate tectonic theory cannot tell us where along a boundary an earthquake will occur just that an earthquake will occur somewhere along that boundary. **[c/u]** In addition, the effects of an earthquake can be felt far away from a boundary. The Boxing Day tsunami in 2004 affected the Maldives which are located intra-plate. Also seismic waves travel and can be felt over a wide area. A very important point to note is that plate tectonic helps the understanding of the educated, particularly in the West. People in LEDCs with poor education will be unaware of plate tectonic theory and many of these are religious, so they will say tectonic events are from god and so plate tectonic theory does not help that understanding because they are not privy to it. **[Strong synopticity]**

*In conclusion the recent conception and development of plate tectonic theory has greatly aided our understanding of the distribution of seismic events. We now understand that plates are continually moving and earthquakes and volcanoes are found along these boundaries. Exceptions to this rule such as Hawaii also help prove tectonic theory due to their unique creation. Whilst this has helped our understanding we also recognise the fact those in LEDCs with poor access to education are unaware of plate tectonic theory so the theory will not yet have helped their understanding. **[Clear conclusion, well rounded]***

[This is a totally focused response that addresses the question very well. The only weakness being that some of the case studies/exemplars, though integrated well into the answer, lack a degree of detail/development, for example with some detail of plate boundaries. All elements of the assessment achieve Level 4 status, and there is a strong sense of coherence, maturity and the ability to think geographically.]

Knowledge - Level 4 (higher)

Critical understanding - Level 4

Case studies - Level 4 (lower)

Synopticity - Level 4 (higher)

Quality of argument - Level 4

Overall Level 4 (higher) - 38 marks.]