

# RIVERS

STATE THE MEANING OF PERCOLATION (2)

Award [2] for a full definition, e.g. The movement of water from the soil in the bedrock/groundwater (store). [2]

EXPLAIN HOW HEAVY RAINFALL ON WET GROUND MIGHT AFFECT THE DISCHARGE OF A RIVER (3)

Award [3] for a statement with consequence and elaboration. E.g. If there is heavy rainfall on already saturated ground the rainwater will not be able to infiltrate the waterlogged ground so there will be an increase in overland flow. This means that there will be an increase in the amount of water reaching the river rapidly leading to an increase in the discharge. [3]

EXPLAIN HOW THE RIVER CHANNEL CHANGES DOWNSTREAM (4)

Level 3 ([4])  
The candidate describes the changes in width, depth and slope and illustrates their answer with data from the table for at least 2 of the 3 aspects. E.g. The river gets wider and deeper downstream for example it increases from a width of 0.66m near the source to 8.50m 9km downstream. It also gets 0.22m deeper, being 0.07m wide 0.30km from the source, 0.16m wide 1.30km downstream and increasing to 0.29m 9km downstream. The channel gradient is similar near the source and 9km downstream 2.5-3 degrees but is much steeper, 7.5 degrees 1.3km downstream. [4]

EXPLAIN FULLY ONE HUMAN CAUSE OF FLOODING IN B. ISLES (3)

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]

DESCRIBE + EXPLAIN, USING THE TABLE HOW THE CHANNELS CHANGE DOWNSTREAM (6)

Level 3 ([5]-[6])  
The candidate describes the changes in shape and size in detail and offers an explanation for both, e.g. The load decreases in size downstream from 21.2cm 0.30km from the source to 2.52cm 9km downstream. It did however increase to 27.2cm at a point 1.30km downstream. The rocks also became more rounded and smoother downstream, e.g. close to the source 80% of rocks were very angular or angular while 9km downstream 60% were well-rounded and 40% rounded. The overall decrease in size is due to the erosional process of attrition whereby the rocks hit against each other breaking down into smaller pieces. In addition the rocks become smoother due to abrasion or grinding the rock fragments against the bed and banks. [6]

HOW CAN HUMAN ACTIVITY INCREASE FLOOD RISK IN URBAN AREAS (3)

Award [3] for a full explanation with elaboration, e.g. Some towns are built on floodplains where there is a high flood risk. Urban areas have much tarmac and concrete and man made drains. These impermeable surfaces lead to rapid run-off into the river causing flooding as water cannot infiltrate the ground.  
Answers could refer to increase in impermeable surfaces, blocked drains or changes in drainage basin due to, e.g. deforestation upstream. [3]

DESCRIBE ONE TRANSFER BY WHICH RAINWATER REACHES THE RIVER (2)

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]

EXPLAIN THE PROCESSES + LANDFORMS AT  
X AND Y IN THIS MEANDER. (6)

Level 3 ([5]-[6])

The candidate identifies and fully explains the processes and the landforms that have been created at both X and Y. Good answers will use specialist terms relating to the processes of erosion and deposition and will have addressed both sides of the river meander – inner and outer banks, e.g. At X deposition is occurring. The river has less energy as it goes around the inside of the bend. Sediment/silt is built up here because the water is slowing down and a slip off slope is formed. At Y, the water is deep and fast flowing which means that erosion will take place. Abrasion and hydraulic action will erode both the river bed and create a small river cliff. [6]

NAME ONE STORE (1)

Trees/Grass/Vegetation, River/Channel, Interception, Soil, Rock, Ground Water storage/Soil moisture storage/surface storage. [1]

DESCRIBE THE DIFFERENCE BETWEEN A  
TRIBUTARY & A CONFLUENCE IN A DRAINAGE  
BASIN. (2)

A tributary is a small stream or river [1], whereas a confluence is where two streams/tributaries meet. [1] [2]

MEANING OF FLOODPLAIN. (2)

Award [2] for a correct definition, with reference to location,  
e.g. An area of (flat) land on either side of the river that holds flood water.  
e.g. An area of flat land either side of the river, made up of alluvium. [2]

Qs MISSISSIPPI. EVALUATE THE RIVER  
MANAGEMENT STRATEGIES USED (8)

Level 3 ([6]-[8])

Candidates provide detailed information (including two specific facts/figures/ places) about river management strategies used on a river outside the British Isles. There is a clear reference to more than one method. There is an evaluation of each method. Distinction within this level is based on the breadth of evaluation and a final evaluative comment/conclusion, e.g. The Mississippi river in the USA has been managed for over 100 years to improve navigation and prevent flooding. One hard engineering method used was levees. These were raised to 15 metres along 3000 km of the river. These measures did help to reduce the amount of flooding of the river – there are fewer floods than previously. However, this strategy is very expensive as there needs to be a constant maintenance programme along the course of the river. Also, many residents complain that these measures spoil the look of the river and the building programme can cause environmental problems. A soft engineering method has been that the US Conservation Service spent \$25 million buying farmland which could be used as washlands. These are good as they do not require much maintenance; however the people who live in the area are worried that the government will allow flooding in their land in order to stop flooding in more sensitive places and cities. In conclusion a combination of both hard and soft engineering strategies are required to manage this river. [8]

EXPLAIN FULLY ONE PHYSICAL CAUSE OF  
FLOODING ON A RIVER IN THE BRITISH ISLES

Award [3] for an accurate physical cause explained and elaborated with a relevant fact/figure/place related to the named river,  
e.g. The River Derwent experienced 250 mm of rainfall over a 2 week period. This caused the land to become waterlogged. This decreased infiltration and increased surface runoff which ultimately led to flooding. [3]

EVALUATE THE BRUNT TO WHICH RIVER MANAGEMENT STRATEGIES OUTSIDE THE BRITISH ISLES ARE SUSTAINABLE (8)

**Level 3 ([6]-[8])**

Need 2 facts/figures/places named for full L3. Candidates provide detailed information about river management strategies used on a river outside the British Isles. There is clear evaluation of the extent to which the strategy is sustainable. E.g. The Mississippi River in the USA has been managed for over 100 years to improve navigation and prevent flooding. The levees were raised to 15 metres along 3000km of the river and meanders were straightened over a 1750km stretch but these strategies are very expensive and require regular maintenance. Such strategies are on sustainable due to cost and environmental problems. Recently the US Conservation Service has spent \$25 million buying farmland prone to flooding and converting it to natural conditions which do not require any maintenance and have no obvious negative environmental impacts. This is much more sustainable than the levees. Some element of judgement needed for top L3. [8]

EXPLAIN THE FORMATION OF A WATERFALL (5)

**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 (corrosion) 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]

SUGGEST ONE REASON WHY THIS LARGE STONE WAS NEAR THE SOURCE (2)

**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]

IMPACTS OF FLOODING (3)

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	→

DIS COMPARE THE SUSTAINABILITY OF ONE HARD + ONE SOFT ENGINEERING STRATEGY (7)

**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]

EXPLAIN THE IMPACT OF MATURE FOREST ON RIVER DISCHARGE (4)

**Level 3 ([4])**

A detailed explanation which refers to the role that additional trees play in affecting the discharge and includes at least 2 key words such as surface runoff, infiltration, transpiration and interception, e.g. Increasing the amount of trees in this area will help to reduce river discharge. When the trees have matured, they will intercept water from the drainage basin through their root system and will then store water and release it through transpiration. This reduces discharge. [4]

## COASTS

EXPLAIN HOW A SANDY BEACH FORMS (4)

### 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 groynes revealing the operation of longshore drift.

[4]

EXPLAIN HOW STACKS FORM (5)

### Level 3 ([4]-[5])

A full explanation of all stages and named processes, indicating clear understanding that a stack is a pinnacle of rock left behind when a headland is eroded.

e.g. Caves are formed on either side of a headland because a notch is eroded by hydraulic pressure and corrosion/abrasion. The caves are eroded right through the headland to make an arch; the roof of the arch becomes unstable and collapses, leaving a stack or pinnacle of rock.

One erosional process named for bottom Level 3. Two processes named for top Level 3.

OUTLINE 2 HUMAN ACTIVITIES IN CONFLICT 4

Award [1] for each of two human activities (actions not viewpoints) which refer to a valid named place. Award up to [2] for an outline of the conflict (place must be relevant to conflict).

e.g. More tourists means more hotels are built on the seafront either forcing local people to leave or pricing them out, for example Costa del Sol.

Good description of human activities and conflict but no place [3].

GIVE 2 REASONS WHY A COASTLINE MAY NEED PROTECTION (4)

An explanation which is developed with an example of what needs to be protected.

e.g. The coastline may have valuable buildings such as an oil terminal which needs to be protected.

e.g. There may be hotels along the coast and a sandy beach which needs to be maintained to attract tourists.

(2 x [1])

[2]

EVALUATE THE SUSTAINABILITY OF 2 METHODS USED TO PROTECT A NAMED COASTLINE (7)

### Level 3 ([6]-[7])

Evaluation of at least two methods, with at least one fact/figure/place for both methods and there must be some judgement or conclusion as to which were more sustainable (costs/effectiveness/maintenance). Fact on one strategy and conclusion but no fact/figure on second for bottom Level 3.

e.g. There was a sea wall built with the new promenade but it needed to be replaced because the old one collapsed in 2002. The new one was expensive at £4 million but protects the promenade at Newcastle because it has a re-curved 'wave-return' design which deflects the waves. However, this causes more erosion of the beach below. Groynes were placed to stop the sand being moved along the beach towards Murlough Bay, but they were made of wood which weathered and so they no longer stop the sand drifting northwards away from Newcastle beach. However, new groynes are costly (over £1000 per metre and last only 20 years) and they may reduce the sand available further down the coast at Dundrum Bay.

Fact on one strategy but no fact/figure on second and no conclusion [5]. In conclusion, groynes may stop longshore drift at Newcastle and are fairly environmentally friendly but can cause problems of sand loss elsewhere so are not sustainable. Sea walls may last but are not always visually attractive and are costly.

[7]

## 3 DIFFERENCES BETWEEN CONSTRUCTIVE + DESTRUCTIVE WAVES (3)

Award [1] for an answer which clearly states the differences between the two waves, e.g. by use of a comparative word such as stronger, higher, more, less, etc.

e.g. Destructive waves have a stronger backwash while constructive waves have a stronger swash when they reach the beach,

e.g. Destructive waves are also more frequent (15 per minute) than constructive waves (6 to 9 per minute), (figures not essential)

e.g. Destructive waves often occur in stormy/windy weather whilst constructive waves can occur in calm conditions,

\* e.g. Destructive waves will erode a beach whilst constructive waves will deposit material and build up the beach.

(3 x [1])

[3]

## STATE THE MEANING OF LONGSHORE DRIFT (2)

Award [2] for a full definition,

e.g. This is when eroded material in the sea is not carried straight up and down the beach but is carried across the beach in a saw tooth course (depending on the wind direction).

[2]

## EXPLAIN HOW AN ARCH IS FORMED (4)

### Level 3 ([4])

The candidate explains in some depth the different processes that were at work in order to form this feature. Reference should be made to how a feature like this is formed first from a crack and then the crack develops into a cave and then an arch can be formed in a headland. There should be a full discussion of the role that erosion by the sea plays in this process and mention should be made of one type of erosion like corrosion/abrasion, solution/corrosion and hydraulic action,

e.g. An arch is formed due to different processes of erosion at work along a line of weakness in the headland. The force of the water on stormy days will batter the rock (hydraulic action) and the water will also pick up stones and boulders and will blast these against the cliffs (abrasion). As a result cracks in the rock will form and these cracks will gradually widen into caves. The erosion process will continue over time and eventually the back wall of the cave will be eroded all the way through the headland for an arch to form. [4]

## C/S EVALUATE ENGINEERING STRATEGIES (7)

### Level 3 ([6]-[7])

Need at least 2 facts/figures/places named for full Level 3. Candidates provide detailed information about river management strategies used on a river outside the British Isles.

e.g. The Mississippi River in the USA has been managed for over 100 years to improve navigation and prevent flooding. The levees were raised to 15 metres along 3000 km of the river and meanders were straightened over a 1750 km stretch but these strategies are very expensive and require regular maintenance, however they do offer good protection to the people who have settled on the floodplain. Recently the US Conservation Service has spent \$25 million buying farmland prone to flooding and converting it to natural conditions which do not require any maintenance and have no obvious negative environmental impacts. [6] Some element of judgement needed for top Level 3. [7]

[7]

EXPLAIN THE CONDITIONS + PROCESSES  
NEEDED TO FORM A SPIT (6)

Level 3 ([5]-[6])

Explanations of at least two conditions required for a spit to develop and processes involved, e.g. Sand is moved along the beach by longshore drift. Sand is washed up the beach at an angle (swash) and comes down straight in the backwash. This means over time material moves along the coast in a zigzag/sawtooth manner until it reaches a change in the shape of the coast. The sand or shingle accumulates and is deposited due to a lack of energy where it forms a narrow ridge. The spit grows over time as more material is deposited. All spits need a constant supply of sand to be deposited or they will be washed away. [6]

NAME + DESCRIBE ONE PROCESS OF EROSION  
WHICH HAS HELPED TO SHAPE THESE SPITS (3)

- (i) Award [1] for naming an erosion process.  
e.g. Abrasion/Corrasion, Attrition or Corrosion/solution).

Award [2] for detailed description of named process.  
e.g. Attrition occurs when rocks collide with each other. As they collide, pieces break off and they become smaller (and more rounded). [3]

NAME THE PROCESS WHERE MATERIAL IS  
LEFT BEHIND DUE TO A LACK OF WAVE ENERGY (1)

Deposition. [1]

## WEATHER + CLIMATE

STATE THE TYPE OF CLOUD ASSOCIATED WITH THUNDERSTORMS (1)

Cumulo-nimbus

DESCRIBE A RAIN GAUGE + EXPLAIN HOW THE AMOUNT OF PRECIPITATION IS MEASURED

Level 3 ([3])

A detailed answer using correct terms e.g. a rain gauge is a cylinder which catches rainfall and has a funnel which directs the rain into a measuring flask. [3]

Level 2 ([2])

A detailed answer e.g. each day the measuring flask is taken out and the amount of rainfall is recorded. [2]

STATE THE MEANING OF SYNOPTIC CHART

Level 2 ([2])

A full answer e.g. a weather map showing the isobar pattern and the symbols for the weather. [2]

EXPLAIN THE T<sub>0</sub>C AT NORWICH WITH A DEPRESSION

Level 3 ([3])

An explanation which accurately links the rising and falling temperatures at Norwich to the passing of firstly the warm front and warm sector with Tropical Maritime air mass and secondly the passing of the cold front and cold Polar Maritime air. (Answer could refer to the direction of cold air mass from NW) [3]

EXPLAIN 2 WHY AN ERUPTING VOLCANO MAY CHANGE THE CLIMATE

Level 3 ([3])

A fully elaborated explanation is provided e.g. the ash ejected into the atmosphere by the volcano blocks out the sunlight or the SO<sub>2</sub> forms sulphuric acid in the atmosphere which reflects solar radiation and this lowers the temperature and so cools the climate. [3]

STATE 2 EFFECTS OF CLIMATE CHANGE

State two effects of climate change (one positive and one negative).

- e.g. Positive: higher crop yields
- e.g. Negative: more pests and diseases
- e.g. drought (causes hosepipe bans)
- e.g. more rain causes flooding

(2 × 1) = [2]

EXPLAIN ONE SUSTAINABLE STRATEGY WHICH COULD BE USED TO DEAL WITH CLIMATE CHANGE

Level 3 ([5])

A fully elaborated explanation e.g. use alternative renewable sources of energy such as wind or tidal power and less oil or coal (e.g. in the UK there is a target of 20% of electricity produced from renewable sources by 2020); renewable energy produces less CO<sub>2</sub> and so would cut emissions of greenhouse gases which trap heat from the sun and is a human cause of climate change. [5]

### 3 CHARACTERISTICS OF CIRRUS CLOUDS

Award [0] for a response not worthy of credit  
 Any three appropriate characteristics, e.g. they are High, white  
 They are thin and wispy.  
 They are found high in the atmosphere.  
 Ice crystals in cirrus clouds.  
 They usually indicate the approach of a warm front.  
 (3 x [1])

[3]

### EXPLAIN WHY CUMULONIMBUS CLOUDS BRING RAIN.

Level 3 ([4])  
 A very detailed statement, e.g. cold polar air undercuts warm tropical air which rises. This causes the warm air to cool rapidly. Condensation begins to occur. Water droplets form and begin to join together. This causes the cumulonimbus cloud to form. When the cloud becomes heavy it will release the droplets in the form of rain. [4]

[4]

### EXPLAIN HOW A WIND VANE WORKS

Level 3 ([3])  
 A very detailed statement that indicates how a weather vane works, e.g. the wind vane has a pointer/arrow that can spin around. The front of the pointer/arrow faces into the wind. Most wind vanes have the points of the compass below the pointer. [3]

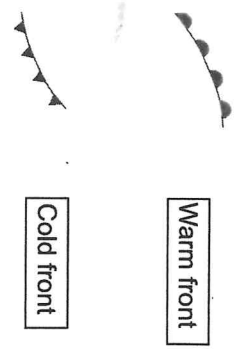
[3]

### WHY IS IT DIFFICULT FOR METEOROLOGISTS TO ACCURATELY FORECAST THE WEATHER

Award [3] for an answer with a statement, consequence and an elaboration,  
 e.g. The weather is always changing because of different weather systems such as depressions change to anticyclones (or vice versa). [3]

Accept references to air masses, weather systems or fronts.

### COMPLETE THE KEY



Warm front

Cold front

- 992 -

isobar

or air pressure or any valid alternative answer (mb, millibars, line of equal pressure etc)

3 x [1]

[3]

### DESCRIBE + EXPLAIN THE CHANGE IN TPC AT NORWICH WITH THE PASSING OF A DEPRESSION

Level 3 ([4]-[5])  
 A detailed answer which describes both the increase and decrease in temperature and explains why with reference to the passing of fronts and air masses named for full Level 3 answer.  
 e.g. The temperature will increase in Norwich and then decrease. This is due to Norwich coming into the warm sector and then the temperatures decrease because the cold front passes. [4]  
 e.g. The temperatures will increase from 6°C to 10°C and then decrease to 4°C as the depression passes. The temperature increases as the warm front passes and falls as the cold front passes. The air masses change: the temperature increases because warm, tropical maritime air is in the warm sector and temperatures fall again as the cold front passes, bringing a cold polar maritime air mass. [5]

[5]

### LIST 3 SOURCES OF WEATHER DATA APART FROM BUOYS

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

(3 x [1])

[3]



STATE ONE FACTOR THAT SHOULD BE CONSIDERED WHEN SITTING A RAIN GAUGE

Award [3] for a statement with a full explanation, e.g. In an open area so that trees or buildings do not shelter the rain gauge and also cause wind eddies which blow raindrops past the gauge.

[3]

EXPLAIN WHY THERE IS HEAVY RAIN + THUNDERSTORMS AT THE COLD FRONT.

Award [3] for a detailed explanation relating to how cloud and rain are caused, e.g. B is at the cold front where warm air is being pushed up by cold air, as the warm air rises, it cools so the water vapour condenses to give rain and cloud.

[3]

DESCRIBE 1 POSITIVE + 1 NEGATIVE EFFECT OF A DEPRESSION ON THE ECONOMY

Award [2] for a developed answer which includes a positive and negative effect with a consequence/elaboration e.g. Heavy rain can cause floods and destroy harvests so farmers lose income, e.g. Strong winds can delay ships so the trade of goods is disrupted, e.g. Depressions can bring rainfall so farmers do not need to spend money on irrigating crops, e.g. Depressions can bring rainfall after a heatwave in summer, so the government does not have to pay to deliver water to homes.

[4]

STATE THE UNIT OF MEASUREMENT USED TO MEASURE CLOUD COVER

Oktas or eighths

[1]

EXPLAIN HOW THE GREENHOUSE EFFECT HELPS CAUSE CLIMATE CHANGE

Award [3] for a detailed explanation linking the greenhouse effect to climate change, e.g. The atmosphere lets in solar radiation [short wave radiation] and the earth re-radiates the heat [as long wave radiation] but it cannot escape because of the layer of gases such as CO<sub>2</sub> or nitrogen in the atmosphere so the temperature increases.

[3]

NAME 2 STRATEGIES TO DEAL WITH CLIMATE CHANGE + EXPLAIN HOW THEY ARE REDUCING IT

Level 3 ([5]-[6])  
Two strategies accurately explained with two facts/figures/places included and reference is made to at least one named place and to how climate change is reduced, e.g. The congestion charge in London has cut the percentage of cars in the Inner Zone by 15% so less pollution is produced. Park and ride schemes have been set up in Belfast so more people leave their car e.g. at Sprucefield/Carryduff Park and Ride and take the bus into Belfast city centre; the bus can use the bus lane on the M1/Saintfield Road and so journey times are shorter and so there is less pollution produced. Both of these strategies mean that there is less greenhouse gas to trap heat so warming has been reduced.

[6]

EXPLAIN HOW THE WEATHER SYSTEM CAUSED HOT + SUNNY WEATHER 3

Level 3 ([3])  
A reason which is elaborated e.g. in areas of high pressure the air is sinking/warming up and so there are no clouds and this means it is warm/sunny during the day and there are high temperatures.

[3]

C/S EVALUATE THE AGUARD + POTENTIAL  
EFFECTS OF CLIMATE CHANGE ON THE  
ENVIRONMENT + ECONOMY

**Level 3 ([5]-[6])**

For top Level 3 an answer which addresses all aspects of the question with good geographical detail and includes at least two facts/figures relating to the country named. Some judgement or conclusion needed for full evaluation.

\*e.g. One benefit of climate change to the UK is that the temperatures will increase. This warmth will enable farmers to earn more income by producing higher yields of crops such as maize, grapes or sugar beets in SE England. However, the extra warmth could bring more pests and diseases such as aphids and mites. These could attack crops, lowering farmer's income or malaria could increase due to the spread north of mosquitoes. However, more warm weather will increase tourism as people will holiday in the UK and these tourists will spend money earning more money for tourist resorts, such as Blackpool [5]. However, overall there could be more benefits to the economy but negative effects in the environment. [6]

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 skillfully and with precision.

EXPLAIN WHY THERE WILL BE NO RAIN  
IN AN ANTICYCLONE

**Award [3]** for an answer that has a statement, consequence and elaboration.

There are no clouds in the sky because air is sinking.  
As air sinks it warms up. This means that condensation doesn't occur.  
Clouds therefore can't develop.

Answers related to the nature of the TC air mass are also creditworthy

[3]

C/S DESCRIBE THE LIKELY EFFECTS  
OF CLIMATE CHANGE ON SOCIETY + ECONOMY

**Level 3 ([5]-[6])**

Both social and economic effects are addressed. A valid case study needs to be used. At least two facts/figures/places must be included to access top Level 3 marks.

A temperature increase of 2°C could lead to an increase in the number of pests and diseases in the U.K. More insect pests, e.g. aphids and mites, could attack crops and therefore lower a farmer's profit. Diseases such as malaria could spread into the U.K. as mosquitoes could survive in the higher temperatures. Higher temperatures will lead to glaciers melting. Low lying areas such as the Fens, Somerset and London could be flooded. This will lead to losses in property and possessions. Millions of pounds will have to be paid out by insurance companies. Governments may have to raise taxes to help strengthen coastal defences. [6]

CHALLENGES & CHALLENGES WITH SECURING  
INTERNATIONAL CO-OPERATION TO DEAL WITH  
CC.

Challenges may include dependence on fossil fuels, development of economy, public resistance to greener technology, financial cost to governments of implementing these agreements.

Countries are heavily dependent on fossil fuels [1]. It is expensive to implement new green technologies to create the same amount of power to sustain the current energy demand. Therefore it's hard to fulfil these agreements. [1]

Many governments have good intentions when it comes to reducing carbon emissions. [1] However some MEDCs such as the USA refuse to sign these treaties as they think it will harm their economy by raising unemployment levels. [1]

Many individuals recognise that climate change is a problem. [1] However, not everyone will exercise responsibility when it comes to energy efficiency or waste reduction. People need to make these personal choices if these agreements are to work. [1]  
(2 x [2])

[4]

## EXPLAIN HOW A BAROMETER MEASURES AIR PRESSURE

Level 3 [3]

Good understanding of how the mercury barometer works by balancing the weight of the mercury in the glass tube against the weight of the air/ air pressure or understanding of how the movement of the lid of the metal box responds to the pressure of the air and is linked to a rotating pointer moving over the scale on the face of the aneroid barometer,

e.g. the glass tube about 1 metre tall is placed upside down in a container and contains a column of mercury with a vacuum at the top.  
When the pressure of the air is high, the weight of the air pushes up the level of the mercury in the glass tube and the reading on the glass tube is high. If the weight of mercury is greater than the air pressure, the mercury level falls. This is because the mercury in the glass tube can fall as the mercury can flow down into the container.  
Accept a valid alternative answer relating to the aneroid barometer.

[3]

## NAME 2 SOURCES OF DATA TO CREATE A WEATHER FORECAST

Weather stations on land collect data which is used to create a weather forecast. Name two other sources of data which can be used to create a weather forecast.

Any two of weather balloons, ships, aircraft, satellites, buoys.

[2]

## IDENTIFY THE CAUSES OF CLIMATE CHANGE IN THE IMAGES

A: burning fossil fuels in power station/gases from power stations/ industry – appropriate gases named not smoke.

B: gases from volcanoes/ash clouds from volcanoes/volcanoes

[2]

## DESCRIBE A POSITIVE + NEGATIVE IMPACT ON THE ECONOMY OF A DEPRESSION WITH PAGES

Level 2 [3]-[4]

Statements relating to both positive and negative effects on the economy during depressions with one clearly linked to the economy [3] and both linked to the economy with named place for [4].

e.g. cold fronts bring heavy rainstorms which could disrupt sporting or other outdoor events such as motor racing at Brands Hatch, costing the organisers money; they also bring rain helping farmers to grow crops such as potatoes and barley which enables farmers in Northern Ireland to make a profit.  
Accept valid alternative answers.  
• At least one named place for top Level 3 [4]

[4]

## DESCRIBE HOW ONE OF THE CAUSES CAN LEAD TO CLIMATE CHANGE

Level 3 [3]

A statement with explanation clearly linked to climate change, e.g. volcanoes erupt producing ash which blocks the incoming rays of the sun because the gases, ash or SO<sub>2</sub> reflect the sun's rays and reduces temperatures so causing climate change.

[3]

Accept valid alternative answers relating to pollution from power stations.

## EXPLAIN HOW SATELLITES HELP TO CREATE A WEATHER FORECAST

Award [3] for an answer that has a statement, consequence and elaboration.

It is a small spacecraft which carries weather instruments. It takes pictures of cloud patterns and records wind speeds which help us determine the types of weather we will have.

[3]

## NAME THE SATELLITE WHICH IS FIXED.

Stationary or Geostationary/static.

[1]

EXPLAIN HOW REDUCING DEForestation  
CAN HELP DEAL WITH CLIMATE CHANGE

Level 3 ([4]-[5])

A very detailed statement about deforestation strategy/strategies which reduces climate change. A clear reference to place for [5].

Trees help to store carbon dioxide, so it is important not to cut them down or burn them. In many countries attempts are being made to stop burning them as this releases carbon dioxide into the atmosphere. Carbon dioxide is a greenhouse gas that leads to global warming which is responsible for the heating of our atmosphere. In the USA a policy called REDD aims to compensate tropical countries, e.g. Guyana who conserve their tropical rainforests. This initiative will save many hectares of rainforest from being cut down.

[5]

STATE 3 REASONS WHY THERMOMETERS  
ARE LOCATED IN A STEVENSON SCREEN

- Air can still flow through
- Painted white to reflect any heat
- Thermometer is not influenced by direct sunlight (box provides shade)
- A more accurate result is obtained
- Consistency in recording for comparison purposes

[3]

DESCRIBE THE DIFFERENCE BETWEEN GLOBAL  
WARMING + THE GREENHOUSE EFFECT

Award [3] for an answer which states the difference between and shows understanding of the two terms,

e.g. Global warming is the rise in the Earth's global temperatures. The greenhouse effect is one of the leading causes of global warming as greenhouse gases trap solar radiation. Human activity has led to an increase in greenhouse gases present within our atmosphere which has resulted in an increase in Earth's global temperature.

[3]

DESCRIBE + EXPLAIN HOW RAINFALL  
CHANGES AS A DEPRESSION PASSES

Level 3 ([5]-[6])

A detailed description and explanation of how the rainfall changes as the depression passes and should include reference to cloud types or air masses, e.g. As the warm front passes the lighter tropical maritime air will rise above the denser polar maritime air mass. This will cause the air mass to cool and condense forming nimbostratus clouds bringing steady rainfall to Newcastle upon Tyne. However in the warm sector there will be low cloud and perhaps drizzle as warm air can hold moisture as water vapour. Finally as the cold front passes, the polar maritime air mass undercuts the tropical maritime air mass forcing it to rise. This leads to the formation of cumulonimbus clouds and will bring heavy rainfall and possible thunderstorms to Newcastle upon Tyne.

[6]

EXPLAIN HOW NATURAL CLIMATE CYCLES  
CAN LEAD TO CLIMATE CHANGE

Award [3] for a detailed explanation with fact/figure, e.g. The Earth's orbit varies a little between circular and more elongated every 100,000 years. Therefore warmer periods have been followed by a period of relative cooling.

[3]

EXPLAIN HOW AN ANEMOMETER RECORDS  
THE WEATHER ELEMENT

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]

# C/S EVALUATE THE EFFECTS OF CC ON A COUNTRY

## Level 3 ([6]-[7])

A valid case study needs to be used. At least two facts/figures/places must be included to access Level 3 marks. An overall conclusion needs to be made at the end.

A temperature increase of 2 °C could lead to the extinction of plant and animal species living in high mountainous areas such as mountain hares. However tree growth will extend northwards and increase in altitude.

Higher temperatures will lead to glaciers melting. Low lying areas such as the Fens, Somerset and London could be flooded. This will lead to losses in property and possessions. Millions of pounds will have to be paid out by insurance companies. Governments may have to raise taxes to help strengthen coastal defences. Overall, there are more negative impacts of climate change in this area [7]

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. [7]

## 2 STRATEGIES AFFECTING CAR USE TO DEAL WITH CLIMATE CHANGE

### 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.

# EXPLAIN THE FOLLOWING WEATHER CONDITIONS IN A WATER ANTICYCLONE

## 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. [3]

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]

## RESTLESS EARTH

### DESCRIBE 1 CHARACTERISTIC OF THE CORE

Accept any valid alternative.

To access [2] there must be a specific fact,

e.g. It is very hot [1] at 5000 °C [1]. Accept anything between 4000°-6000°C.

e.g. It is solid [1] made from nickel and iron [1].

[2]

### DESCRIBE THE DISTRIBUTION OF EQ + VOLCANOES

#### Level 3 ([4]-[5])

A very detailed answer that includes the distribution of earthquakes and volcanoes along with a reference to latitude and longitude and to the distance from the plate boundary. Answers which focus on latitude and longitude or scale bottom Level 3. Answers which address both latitude/longitude and scale, top Level 3.

e.g. There are only 7 volcanoes on the North Island and a total of 14 earthquakes all over the country. There are no volcanoes on the South Island; however, many earthquakes have occurred on the South Island of New Zealand. They seem to occur in a linear pattern going from the SW to the NE (or vice versa) of New Zealand extending to approximately 1000 km in length. They occur from 44°S to 38°S and 166°E to 176°E.

[5]

### C/S ONE STORY + ONE LONG-TERM IMPACT OF AN EQ IN A COUNTRY

e.g. In the short term the 9.0 earthquake triggered a large tidal wave which reached 30 m in some places. It circled the Indian Ocean affecting all the countries with a coastline there. Many coastal ecosystems around the Indian Ocean, such as mangroves and forests, were flooded, and coral reefs destroyed. These will take months or possibly years to recover. [6] Answers relating to the shortening of the length of the day and energy released are also valid.

[6]

### EXPLAIN WHY EQ + VOLCANOES ARE FOUND AT DESTRUCTIVE PLATE MARGINS

#### Level 3 ([5]-[6])

A very detailed statement on how both earthquakes and volcanoes occur. To achieve this level candidates should make clear reference to what happens at a destructive boundary. Specialist terms will be evident, e.g. Earthquakes occur here because plates are moving towards each other. It is a destructive plate boundary. The plates move slowly and from time to time they stick. Pressure begins to build up and when the pressure is released shock waves are emitted from the focus, creating an earthquake. Volcanoes occur here as one plate is subducted under another plate [5]. The edge of the plate is destroyed and turns to magma. The magma rises to form a volcano which may erupt due to pressure building up.

[6]

### EXPLAIN HOW A LAVA PLATEAU OR VOLCANIC PLUG FORMS (3)

Award [3] for a full explanation of the formation of a lava plateau, e.g. Molten magma from the mantle rises to the surface, where it can come through lines of weakness in the crust called fissures. Large outpourings of lava occur, which will harden into a lava plateau made of basalt.

Award [3] for a full explanation of the formation of a volcanic plug, e.g. A plug is made from magma which hardens as it rises inside the vent. The surrounding rock is eventually eroded leaving the volcanic plug.

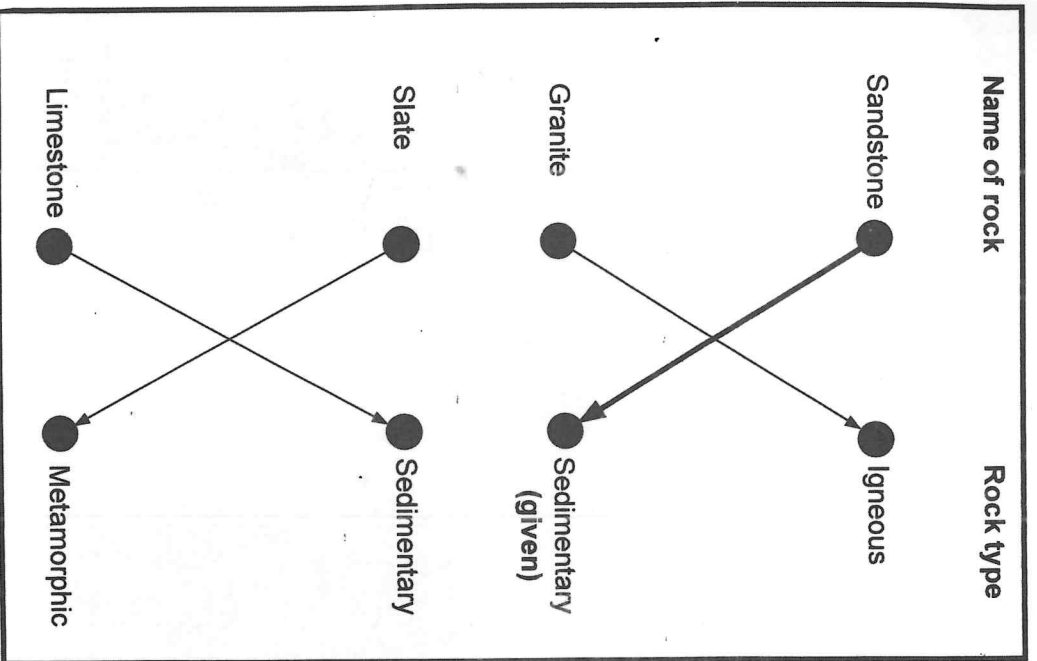
[3]

### EXPLAIN HOW PLATES MOVE (3)

Award [3] for a statement, consequence and elaboration which makes a link to the rising or falling currents, e.g. Plates can move because they rest on the molten magma of the mantle which moves in convection currents so that where magma rises the plates were pulled apart (or where the magma sinks in a convection current the plates are dragged down and destroyed).

[3]

## MATCH THE ROCK TYPES



## EXPLAIN HOW SEDIMENTARY ROCKS FORM

e.g. Sediments which have been eroded from the rocks on the land are carried into the sea by rivers and are deposited on the seabed; these sediments are compressed and compacted under their own weight so air and moisture are squeezed out and so over a long time will build up in layers forming solid rock. [3]

## EXPLAIN THE FORMATION OF A VOLCANIC PLUG

Award [3] for a developed explanation with elaboration which shows understanding of the hardened magma being more resistant to erosion so that the plug stands out in the landscape, e.g. A plug forms inside a volcano when magma cools as it rises towards the surface and hardens into dolerite rock; the sides of the volcano are eroded but the dolerite is more resistant and so stands out as the plug when the surrounding rock of the volcano is eroded. (not necessary to name dolerite rock) [3]

## EXPLAIN WHY SO FEW EQS ARE LOCATED IN THE BRITISH ISLES

Award [3] for a developed explanation which refers accurately to the location of the British Isles and shows understanding of intra-plate earthquakes and contains elaboration with named place, e.g. The British Isles are far from a plate boundary at the Mid Atlantic Ridge; they are in the middle of the Eurasian Plate and it is movement at the plate boundary where stress builds up and it travels from the plate boundary to the middle of the plate. [3]

## C/S TO EFFECTS OF A NAMED EQ IN THE BRITISH ISLES

Award [2] for a detailed effect which includes case study detail relating to the effect or damage, e.g. The Market Rasen earthquake in 2008 caused buildings such as the stone cross on the medieval church to fall. [2] e.g. A 19-year-old man broke his pelvis when the chimney collapsed onto his bedroom. (2 x [2]) [4]

DESCRIBE THE GLOBAL DISTRIBUTION OF VOLCANOES USING THE MAP

Level 3 ([4])

A statement with two accurate named places and reference to plate boundaries and to one exception such as volcanoes in the centre of the Pacific Ocean for full Level 3 [4],  
e.g. volcanoes are along plate boundaries such as around the Pacific Ocean called the Ring of Fire and down the west side of North America (Cascade Range). There is an East/West belt through the Mediterranean Sea and a North/South belt down the middle of the Atlantic Ocean. There are also volcanoes in the middle of the Pacific Ocean which are not on a plate boundary. [4]

EXPLAIN HOW SEDIMENTARY ROCKS FORM

Level 3 ([3])

A statement with a consequence and elaboration which uses correct geographical terminology,  
e.g. the layers of sediment which come from eroded rocks build up in layers on the sea bed; compression of the layers squeezes out air and water over a long period of time to create new rock called sedimentary rocks. [3]

EXPLAIN HOW FOLD MTS FORM AT A COLLISION BOUNDARY

Level 3 ([3])

A statement with a consequence and elaboration which uses correct geographical terminology,  
e.g. two plates, each carrying a landmass, move towards each other so that the sediments between them or the crustal rocks are crumpled up and they are pushed or folded upwards to form ranges of high mountains. [3]

C/S THE CAUSES + IMPACTS OF ANEWS IN THE BRITISH ISLES (MARKET RASEN, LINCOLNSHIRE)

Cause

Level 1 ([1])

A simple statement,  
e.g. the rocks moved/a fault occurred in the rocks.

Level 2 ([2])

A statement with a consequence,  
e.g. the rocks moved because stress had built up at a fault and was suddenly released. [2]

Impact

Level 1 ([1])

A simple general statement,  
e.g. some parts of buildings collapsed/people were hurt.

Level 2 ([2])

A statement with consequence,  
e.g. some people were hurt when a chimney collapsed.

Level 3 ([3])

A statement with a consequence and elaboration containing a fact/figure/place relating to the named earthquake,  
e.g. some people were hurt when chimneys/roofs of houses collapsed in South Yorkshire  
or  
e.g. the old church in Market Rasen is a Grade II listed building and a stone cross fell, causing £10 000 worth of damage. [3]  
Accept valid alternative answers.  
NB Maximum Level 1 for cause and Level 1 for effect if no named place or earthquake outside British Isles. i.e [1] each



# EXPLAIN WHY PLATES MOVE

**Award [3]** for a statement with a consequence and elaboration relating to the plates being moved, e.g.  
 Plates float on the mantle which has convection currents which move molten magma upwards towards the crust. These currents spread out at the surface and carry the plates above them.  
 The molten material cools and sinks back down again dragging plates along like a conveyor belt.

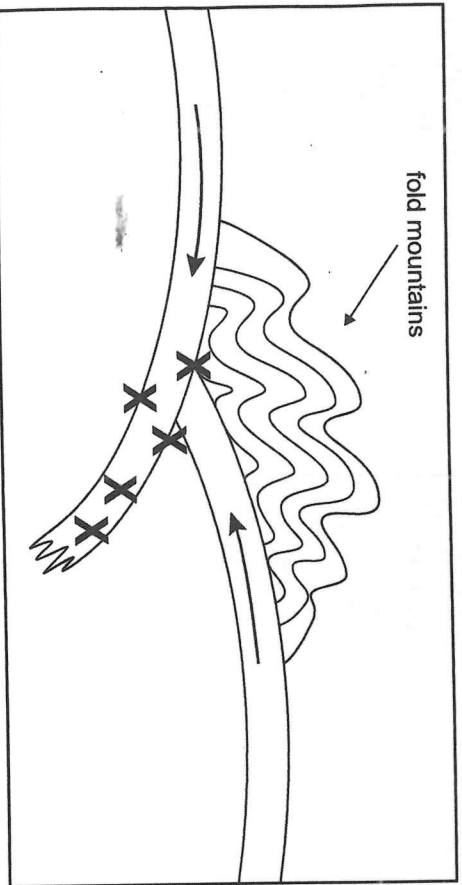
[3]

# MATCH THE ROCK TO ITS TYPE

Name of rock	Rock type
Sandstone	Igneous (given)
Basalt	Sedimentary
Slate	Metamorphic

[2]

# DRAW THE DIRECTION OF PLATE MOVEMENT + THE FOCUS WITH A 'X'



[3]

**Award [1]** for each correct colliding arrow  
**Award [1]** for labelling earthquake focus (one only required)

# NAME THE PLATE BOUNDARY

Collision boundary/Destructive Boundary

[11]

# STATE THE MEANING OF TSUNAMI

**Award [2]** for a full definition, referring to earthquakes as the cause, e.g.  
 A tsunami is a large wave, caused by an underwater earthquake.

[2]

# C/S - EXPLAIN THE CAUSE OF AN EQ IN A WDC

**Award [3]** for a statement with a consequence which refers to how plates moved and friction or stress built up to create an earthquake. There must be a fact related and accurate to the named earthquake, such as the Indian Ocean earthquake of 2004, e.g.  
 In the Indian Ocean earthquake of 2004, the Indo-Australian and the Sunda plates collided and the ocean plate went under (was subducted under) the European plate. The stress or friction built up between the two plates and they suddenly jerked free, creating an earthquake which sent out shock waves and a tsunami.

[3]

# C/S - MEDC EQ - EVALUATE THE SUCCESS OF PRECAUTIONS BEFORE THE EVENT

## Level 3 ([5]-[6])

Good descriptions of at least two precautions and discussion of both how they were successful and some reference to their limitations with knowledge shown by at least two specific facts/places related to the named earthquake for top Level 3. Some judgement or conclusion needed for full evaluation.  
 E.g. Earthquake drills took place every 1st September in Kobe so that people knew what to do when an earthquake happened, such as have a kit ready with a bucket to put out fires, a torch and head protection to keep people safe. There were also buildings constructed to withstand earthquakes by having cross beams, springs and rubber pads to absorb the shaking, so that they did not collapse and kill people. However, despite these precautions, many buildings collapsed, 5500 people died and 40000 were injured in the Kobe earthquake of 1995.

C/S - EQ - DESCRIBE 1 LONG TERM  
MANAGEMENT STRATEGY USED TO MANAGE  
THE EFFECTS

Level 3 ([3])

A statement with a consequence and elaboration containing a fact/figure/  
place relating to the named earthquake,  
e.g. make buildings more earthquake-proof as in Kobe in Japan they added  
cross-beams so that shockwaves are spread through the building,  
e.g. Kansai International Airport will be able to survive severe earthquakes  
because of this high-tech structure,  
e.g. a tsunami warning system was put in place around the Indian Ocean in  
2006 using 25 new seismograph stations which were set up to relay  
information to national tsunami information centres so that people could be  
alerted in future earthquakes. [3]  
Accept valid alternative answers.

DESCRIBE THE GLOBAL DISTRIBUTION OF  
VOLCANOES

Level 3 ([4])

A statement with two accurate named places and reference to plate  
boundaries and to one exception such as volcanoes in the centre of the  
Pacific Ocean for full Level 3,  
e.g. Volcanoes are along plate boundaries such as around the Pacific  
Ocean called the Ring of Fire and down the west side of North  
America (Cascade Range). There is an East/West belt through the  
Mediterranean Sea and a North/South belt down the middle of the  
Atlantic Ocean. There are also volcanoes in the middle of the Pacific  
Ocean which are not on a plate boundary. [4]

EXPLAIN THE FORMATION OF A LAVA PLATEAU

Level 3 ([4])

A full explanation of the formation of a lava plateau e.g. molten  
magma from the mantle comes to the surface, where it can come  
through lines of weakness in the crust called fissures, large  
outpourings of lava occur, which will harden into large lava plateaux  
made of basalt. [4]

EXPLAIN HOW A MID OCEAN RIDGE  
FORMS

Level 3 ([4])

An answer which acknowledges that it is formed at constructive/  
divergent plate boundary and discusses the idea of a spreading seafloor  
caused by convection currents in the mantle,  
e.g. A mid-ocean ridge is an underwater volcanic feature formed by  
plate tectonics where the plates pull up at constructive/divergent plate  
boundary. The uplifting of the ocean floor occurs due to the action of  
convection currents which rise in the mantle beneath the oceanic crust  
bringing magma to the surface where the currents spread sideways. As  
the plates pull apart magma wells up to fill the gap through cracks and  
a line of volcanoes. As the rising magma cools it forms new crust which  
becomes part of the ridge. [4]

NAME A METAMORPHIC ROCK + HOW IT  
FORMS

1. Award [1] for marble, slate or other correct response;

[1]

Award [3] for an answer which explains what rock the metamorphic rock  
originated as and refers to the role of both heat and pressure in altering the  
original rock,  
e.g. Marble is a metamorphic rock changed from limestone due to the impact  
of heat and pressure. [3]

C/S SHORT + LONG TERM IMPACTS OF EQ ON  
ENVT - INDIAN OCEAN EQ

Level 3 ([5]-[6])

A very detailed answer referring to both short term and long term  
impacts on the environment. One fact/figure needed for [5]. Two facts/  
figures needed to access [6].  
Answers relating to the shortening of the length of the day and energy  
released are also valid.

e.g. In the short term the 9.0 earthquake triggered a large tidal wave  
which reached 30m in some places. It circled the Indian Ocean affecting  
all the countries with a coastline there. Many coastal ecosystems around  
the Indian Ocean, such as mangroves and forests, were flooded, and  
coral reefs destroyed. These will take months or possibly years to  
recover.

C/S MEDC EQ - EVALUATE THE SUCCESS OF ONE PRECAUTION USED BEFORE THE EQ HAPPENED.

Award [3] for a good description of one precaution with clear evaluation of its success/limitations; the answer must demonstrate specific case study knowledge to measure the success of the precaution with one specific fact/figure/place related to the named earthquake for Level 3.

e.g. Water was stored in underground cisterns so people had water if water pipes were shaken and snapped, but not enough water was available: this meant when fires broke out in the many wooden houses in the Nagata district of Kobe, many people were injured or killed. e.g. There was a public education programme in Japan so that people had practised evacuation and they knew to move calmly outside; however there were not enough open spaces such as parks in the Nagata district of Kobe for people to assemble safely in 1995; the green belts along the river valleys had been planned but not created so many people died as buildings collapsed onto the streets.

e.g. In Kobe many of the more modern buildings constructed after 1980 could withstand an earthquake by having cross-beams, springs and rubber pads to absorb the shaking; this means they did not collapse and kill people, e.g. Kansai International Airport or the Akashi Bridge remained intact; however despite this precaution, many older buildings collapsed. [3]

EXPLAIN HOW EQS FORM AT CONSERVATIVE MARGINS

Award [3] for a full explanation with a link to shock waves, e.g. Two plates collide and stress or pressure builds up due to friction between the plates so the plates move suddenly and shake the rock sending out shock waves creating an earthquake. [3]

STATE THE MEANING OF LIQUEFACTION

Award [2] for a developed definition, e.g. an earthquake shakes wet soil/ground so the water rises to the surface and the solid soil becomes liquid mud. [2]

C/S - EQ - IMPACTS ON PEOPLE + ONE STRATEGY TO PROTECT PEOPLE IN FUTURE

Level 3 (16-17) (INDIAN OCEAN EQ 2004)

At least two impacts with detail on one strategy implemented for the future and elaboration to include at least two facts/figures/places related to the named earthquake, e.g. There were up to 200 000 deaths from this earthquake in many countries around the Indian Ocean as far away as India and Sri Lanka; the sea level rose due to a tsunami so that water supplies were contaminated so people had to move away from the coast as in the Maldives where people had to leave 17 low-lying coral islands at the coast; one strategy for the future is that tsunami early warning systems at the coast; seismograph stations linked to national tsunami information systems has been set up in the Indian Ocean so that people can be warned about tidal waves and they have time to move inland to higher land. [17]

FORMATION OF BASALT COLUMNS

Level 3 (14-15)

A statement, consequence and elaboration for a named area, e.g. At the Giant's Causeway magma poured out from the mantle through cracks or fissures in the crust and the lava cooled slowly in hollows. It contracted into hexagonal or pentagonal columns [4] and hardened into basalt which was then exposed by erosion at the coast over many years. [15]

EXPLAIN HOW BASALT FORMS

Award [3] for a statement with a consequence and elaboration which refers to cooling and small crystals forming, e.g. Molten magma rises from the mantle and flows to the surface where it cools quickly forming small crystals as it hardens into basalt. [3]

2 REASONS WHY EDs ARE MORE  
DAMAGING IN LEDCs THAN MEDCs

**Level 3 ([4])**

An answer which compares the response of MEDCs and LEDCs. At least two comparisons should be included, e.g. In LEDCs construction standards tend to be poor. Homes and other buildings may suffer serious damage and collapse when an earthquake strikes, resulting in high death tolls. In contrast, MEDCs buildings are often built to be quake proof and use fire-resistant materials. In LEDCs evacuation and other emergency plans can be difficult to put into action due to limited funds and poor communications. However in MEDCs emergency plans are well rehearsed, e.g. practice drill days. [4]

EXPLAIN HOW GRANITE FORMS

Level 3 [3] answers will give a full explanation of how either granite, slate or sandstone is made. e.g. granite is made from molten rock which hardens under the ground, so it cools slowly allowing large crystals of minerals like quartz to fuse together. [3]

C/S DESCRIBE THE IMPACTS OF AN EQ  
IN THE BRITISH ISLES

**Level 3 ([5-6])**

A detailed answer which outlines at least three impacts of an earthquake in the British Isles; including at least two specific facts/figures.

e.g. In February 2008 an earthquake measuring 5.2 on the Richter Scale hit Market Rasen in England. It caused damage to the surrounding area. A stone cross fell from a church and hit the building's roof, causing about £10,000 of damage. Several people were hurt, like a man in South Yorkshire who suffered broken bones when a chimney fell on him. Also people heard a strange roaring noise when the earthquake happened.