

## Physical Environment PPE Feedback

**A01 – Demonstrate knowledge** of locations/places/processes, environments and different scales (15% of all questions will be A01)

**A02 – Demonstrate geographical understanding of:**

- Concepts and how they are used in relation to places, environments and processes
- The interrelationship between places environment and process. (25% of questions are related to A02)

**A03 – Apply knowledge** and understanding to interpret, analyse and evaluate geographical information and issues and to make judgements (35% of questions relate to A03)

**A04 – Select, adapt and use a variety of skills** and techniques to investigate questions and issues and communicate findings (25% of questions)

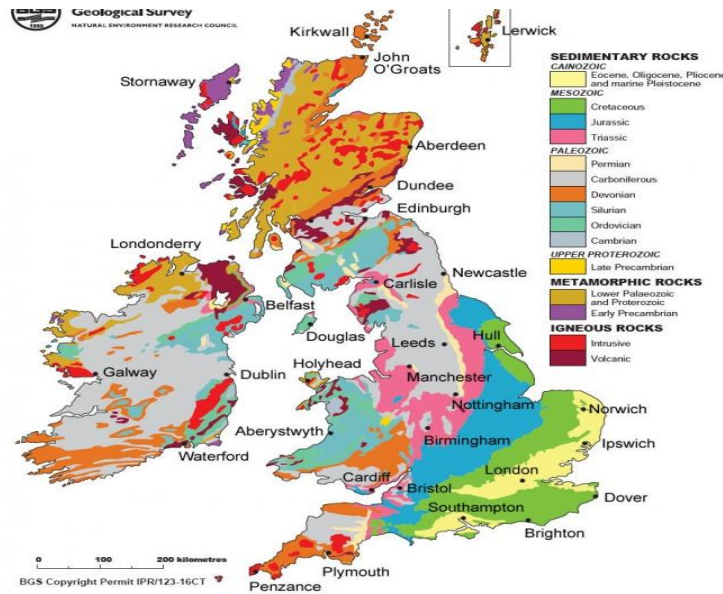
How are the command words associated with the number of marks I can get?						
	1	2	3	4	8	12
Identify/state/name						
Define						
Label						
Calculate						
Draw/plot						
Compare						
Describe						
Explain						
Suggest						
Examine						
Suggest						
Examine						
Assess						
Evaluate						
Discuss						

# The changing landscape of the UK

1. Explain one reason why areas of igneous rock are usually upland. (2 marks)

**a) 3 main rock types**

- Igneous** – created by volcanic activity when magma/lava cools, made of crystals, v.hard and resistant to erosion.
- Sedimentary** – formed of small particles that have been eroded, transported & deposited in layers or remains of plants/animals. A mixture of hard/soft.
- Metamorphic** – formed from other rocks changed by extreme pressure/heat e.g. slate. Mostly hard rock.



.....

.....

.....

.....

.....

.....

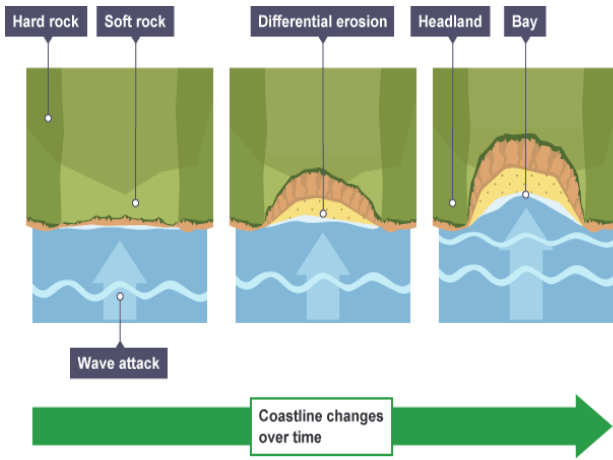
.....

## Mark scheme

- Award 1 mark for a point about one of the characteristics of igneous rock and another 1 mark for the explanation.
- Igneous rocks are more resistant rocks (1) which means they are less easily eroded (1)
- Igneous rocks are hard (1) which means they are less easily eroded (1)
- Igneous rocks are formed by volcanoes (1) which erode very slowly (1)

## Coastal Landscapes and Processes

1. Explain one way rock type leads to the formation of headlands. (2 marks)



### Headlands and bays

1. Coastlines are made of alternating bands of soft rock and hard rock (more resistant and less resistant)
2. Less resistant rock such as clay is eroded more quickly, this retreats back forming a bay
3. More resistant rock such as granite is eroded more slowly. This protrudes (sticks out) forming a headland.

.....

.....

.....

.....

.....

.....

.....

### Exam mark scheme

Award 1 mark for a point about rock type (1) and a further development point linked to the formation of headlands (1).

- More resistant rock type (1) will erode more slowly (1)
- Less resistant rocks (1) will erode more rapidly forming bays (in between headlands)
- Less heavily jointed/faulted rock (1) will erode less rapidly (1)
- More heavily jointed/faulted rocks (1) will erode more rapidly forming bays (with headlands on either side) (1).

Study Figure 2 in the Resource Booklet.

2. **Examine** how coastal retreat has affected **people** and the **environment** in the landscape shown in Figure 2.

Annotate the images with potential impacts – circle any information on the map that may be of use to you.



**Figure 2**  
**Aerial photographs showing the coastline at Happisburgh, East Anglia in 1996 and 2012**

Examine

= Breaking down the question down into individual points/processes and explaining how each one contributes to the questions topic.

## Mark Scheme

Level	Mark	Description
1	1-3	<ul style="list-style-type: none"><li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed.</li><li>• An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited A03 evidence.</li><li>• Uses some geographical skills to obtain information but with limited relevancy,</li></ul>
2	4-6	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesis mostly relevant understanding, but not entirely clearly (A03)</li><li>• Uses geographical skills to obtain accurate information that supports some aspects of the argument (A04).</li></ul>
3	7-8	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced and well developed argument that synthesises relevant understanding clearly leading to judgements that are supported by evidence throughout (A03)</li><li>• Uses geographical skills to obtain accurate informatinoo that supports aspects of the argument (A04).</li></ul>

### A03

- The coastline has been eroded by waves. Erosional processes at work have included abrasion and hydraulic action.
- This will have led to the destruction of habitats for animals and plants.
- The beach has been eroded and/or removed by the process of longshore drift. This will have led to more erosion of the cliffs as the beach helped t protect them.
- This had resulted in the erosion of the beach and the cliffs behind it. This has led to the erosion of farmland.
- As the beach has been eroded this has reduced the attraction to tourists. This may have led to a reduction in tourist income.
- Buildings have disappeared which may have been due to cliff collapse. This will have impacted on people and led to loss of money.

### A04

- The beach to the south/south-east has become narrower.
- Its width has deceased from approximately 80-90 metres to 30 metres.
- The beach in the north/north-west has almost entirely disappeared.
- Its width has reduced from 30 metres to less than 10 metres.
- The groynes in the north have disappeared.
- The cliffs have retreated inland in the southern/south-western part.
- The coastline was quite straight now has a sharp change in direction.
- A line of houses parallel to the coastline has been lost.
- Some caravans have also been lost in a line 200-230 metres from the bottom of the photo.



## River Processes and landforms

Study figure 3 in the resource Booklet

1. **Examine** how land use affected the storm hydrographs for river A and River B shown in Figure 3.

A flood hydrograph describes the changes in the volume (amount) of water in a river after precipitation has fallen. The volume of water flowing in a stream at a **given point** is called a river's **discharge**.

### **Characteristics of a hydrograph**

1. There is a **bar graph** which shows the amount of precipitation that has fallen since the start of the storm. The amount is measured in millimetres on the y axis.
2. There is a line graph which shows the changes in discharge usually over a period of several days. The discharge is measured using the scale of cumecs.

Various labels are used to understand what a hydrograph is showing us.

- Rising limb – the rising flood water in the river
- Peak flow – the maximum discharge in the river
- Falling limb – the falling flood water in the river
- Base flow – the normal flow of the water
- Basin lag time – the time difference between the peak of the rain storm and the peak flow of the river

View a flood hydrograph as a series of parts:

### **1. The beginning of a storm**

When the storm starts the river discharge is unaffected because, apart from direct precipitation, water takes time to reach the river.

### **2. The Rising Limb**

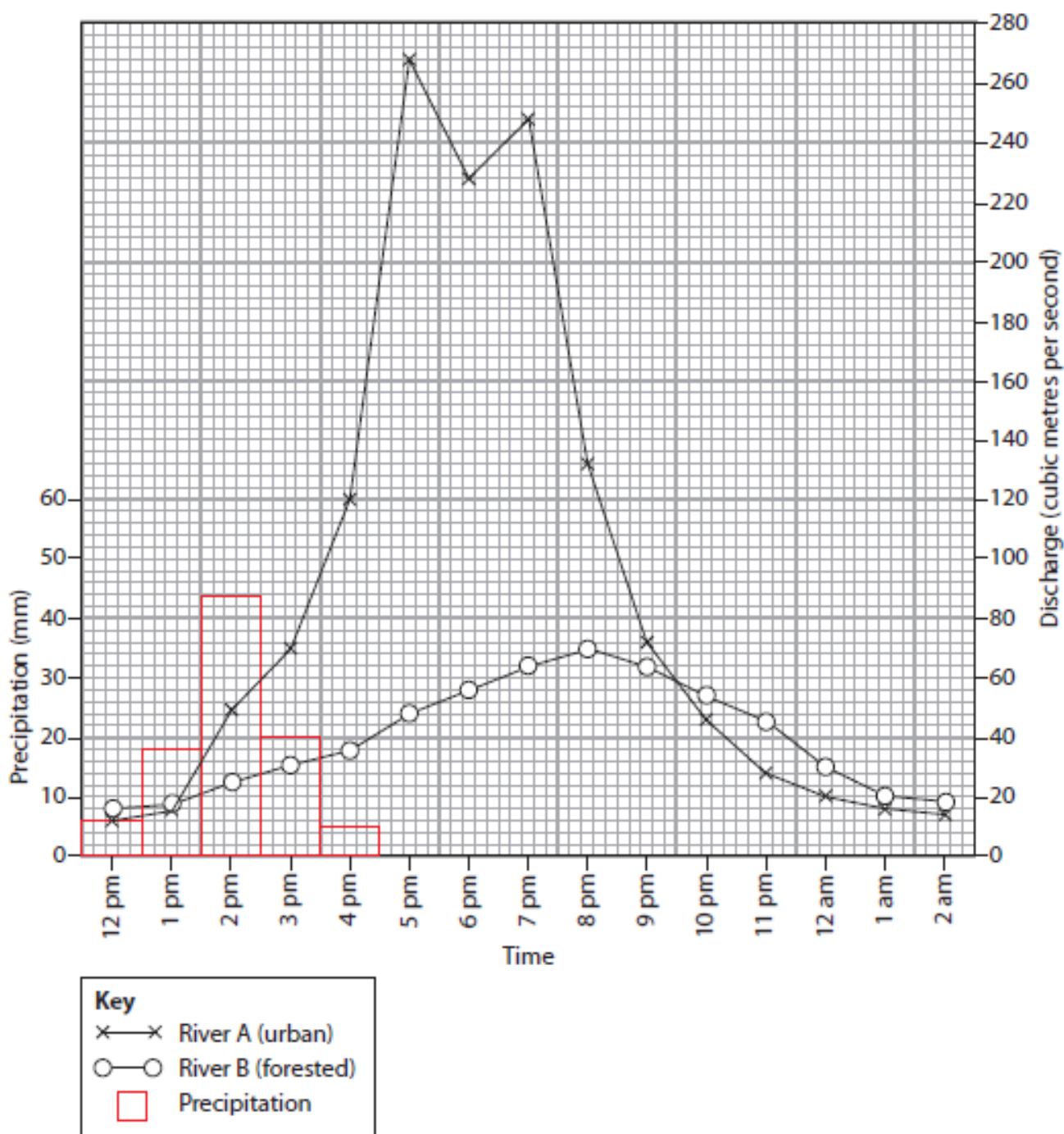
- This is the increase in discharge of the river as water enters it from surface run off and through flow.
- A steep rising limb shows that water reaches the river very quickly, a gentle rising limb shows that the water reaches the river slowly.
- A river that has a steep rising limb will most likely flood.
- The basin lag time tells us how quickly water in a drainage basin reaches the main river.

### **3. The Falling limb**

- This is the decrease in discharge as the river level falls after the storm.
- The discharge decreases at a slower rate that it increases. This is because the slower groundwater flow is still arriving in the river as it takes longer.

Label the flood hydrograph for river A and B:

- Rising limb – the rising flood water in the river
- Peak flow – the maximum discharge in the river
- Falling limb – the falling flood water in the river
- Base flow – the normal flow of the water
- Basin lag time – the time difference between the peak of the rain storm and the peak flow of the river





## What happens when water reaches the land?

When precipitation falls from the sky, it enters a rivers **drainage basin**. A drainage basin is an open system where water is added and lost. The definition is an **'area of land that is drained (emptied) of water by a river and its tributaries'**. Within a drainage basin, there are a number of inputs (precipitation), stores, transfers and outputs.

- **Input:** this is how water enters the drainage basin e.g. through precipitation
- **Output:** this is how water leaves the drainage basin e.g. evaporation, transpiration and flowing into the sea
- **Store:** this is something that holds/intercepts the water e.g. rivers, lakes, glaciers, soil and vegetation
- **Transfers:** this is something that moves the water across or in the ground:
  1. Surface run off – water traveling over the ground (the fastest transfer)
  2. Infiltration – water entering the ground through the soil
  3. Throughflow – water soaks through the soil and runs down the slope through it
  4. Ground water flow – water soaks into pores and cracks in the rock deep underground (the slowest transfer)

## Why do urban catchments result in a higher river discharge?

- Urban surfaces are impermeable such as tarmac and concrete – this means water cannot infiltrate down leading to increased surface run off.
- Drainage systems transport water to the river quickly.
- Deforestation/reduced vegetation means that there is less interception and storage of the water in plant roots. Conversely, more vegetation leads to greater interception, and reduces surface run off as more water can travel through groundwater flow which takes longer to reach the river.



## Mark Scheme

Level	Mark	Description
1	1-3	<ul style="list-style-type: none"><li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed.</li><li>• An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited A03 evidence.</li><li>• Uses some geographical skills to obtain information but with limited relevancy,</li></ul>
2	4-6	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesis mostly relevant understanding, but not entirely clearly (A03)</li><li>• Uses geographical skills to obtain accurate information that supports some aspects of the argument (A04).</li></ul>
3	7-8	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced and well developed argument that synthesises relevant understanding clearly leading to judgements that are supported by evidence throughout (A03)</li><li>• Uses geographical skills to obtain accurate information that supports aspects of the argument (A04).</li></ul>

### A03

- Following the storm event the flow in both rivers does increase.
- The discharge of River A rises much more quickly than for River B.
- This is due to a number of reasons:
  - Urban areas have more impermeable surfaces (concrete, tarmac). This means that less rainwater infiltrates into the ground and there is more surface run-off.
  - Urban areas have drains which empty water more directly into the river which is much quicker.
- The rainwater in urban areas therefore enters the river more quickly leading to a steep **rising limb** and **falling limb**.
- The discharge for River B rises more slowly than River A:
  - It is a forested area. This means that there are fewer impermeable surfaces and greater infiltration of water into the ground.
  - Some of the rain is intercepted by the leaves and stored. The rain which has infiltrated into the ground will make its way slowly to the river as through flow or ground water flow.

### A04

- River A's lag time is 3 hours while River Bs lag time is 6 hours
- The peak discharge for River A is 268 cumecs while River B peak discharge is 70 cumecs.
- River As discharge peaks at 5pm, then falls slightly before rising again to a secondary peak. River B only has a single peak.
- River A's rising and falling limbs are much steeper than River Bs.

## Weather Hazards and Climate Change

Assess the following statement '*Drought is mainly due to natural causes*'.

Assess = use evidence to decide the importance of all factors involved in the topic/theme.

<b>Drought</b>	
An acute water shortage with long periods of lack of rainfall. There are two main causes.	
Meteorological drought (air & rain)	Hydrological drought (water levels)
<p>This type of drought means that the air is really dry and so it receives less rain than usual.</p> <ul style="list-style-type: none"><li>• An area can be classed as in a drought even if it receives more precipitation than area not in drought. This is because a drought occurs when a place receives less rain than is normal for that location.</li><li>• For example, the Great Australian Desert might not be classed as being in a drought even though it receives very little rainfall as this is normal.</li><li>• This type of drought is caused by a change in the usual weather pattern of a region and therefore <b>physical factors</b> such as:<ol style="list-style-type: none"><li>a) Changes to global atmospheric circulation (the way hot air is transported from the equator around earth)</li><li>b) An <b>El Nino</b> event occurs when surface temperatures in the tropical regions (hot) leading to a low pressure system (rising air, cooling, raining) are changed. This reduces the rain seasons that some regions rely on.</li></ol></li></ul>	<p>This type of drought refers specifically to the impact of low rainfall on hydrological systems such as rivers.</p> <ul style="list-style-type: none"><li>• This type of drought is less notable than a meteorological drought.</li><li>• A farmer may notice a loss of soil moisture quite quickly as there is less transfer of water taking place.</li><li>• As less water enters the soil because of lack of precipitation, surface water in rivers becomes difficult to access leading to an over reliance on artificial water supplies.</li></ul>

## Mark Scheme

Level	Mark	Description
1	1-3	<ul style="list-style-type: none"><li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed.</li><li>• An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited A03 evidence.</li><li>• Uses some geographical skills to obtain information but with limited relevancy,</li></ul>
2	4-6	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An unbalanced argument that synthesises mostly relevant understanding, but not entirely clearly (A03)</li><li>• Uses geographical skills to obtain accurate information that supports some aspects of the argument (A04).</li></ul>
3	7-8	<ul style="list-style-type: none"><li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced and well developed argument that synthesises relevant understanding clearly leading to judgements that are supported by evidence throughout (A03)</li><li>• Uses geographical skills to obtain accurate information that supports aspects of the argument (A04).</li></ul>

### A02

- Drought is an acute water shortage associated with long periods of serious or severe rainfall deficiency.
- It exists where there is far less water in a particular area over a period of time than usual.
- There are 2 main causes of drought: meteorological drought and hydrological.
- Meteorological drought is the shortfall of precipitation (rain) over a period of time.
- It can be caused by physical factors (e.g. natural variations in atmospheric conditions, El Nino events) and by human factors (deforestation and climate change)
- Hydrological drought results from decreasing river and reservoir levels.
- This can be linked to the causes of meteorological drought but also linked to their factors (poor farming practices, over abstraction of water due to rising population)

### A03

- Physical causes are a key cause of drought in many cases.
- This applies both at a global scale (e.g. Sahel region of Africa) but also on a more local scale e.g. the south-east of England compared to Scotland.
- However, the role of human impact in causing drought appears to be increasing.
- At a global scale there is evidence that global warming (linked to the greenhouse effect) is leading to drought in some locations.
- At a more local scale, there is also evidence of growing human impact on rainfall reliability.



## Ecosystems, Biodiversity and Management

1. **Evaluate** the impact of physical and human factors on the biodiversity of deciduous woodland ecosystems

Evaluate = weigh up the pros and cons and come to a conclusion.

### **A02**

- Deciduous woodlands have only moderate biodiversity compared to tropical rainforest. They are dominated by 3 to 34 species (e.g. oak tree, beech and ash trees). Other plant species in the sub-canopy and herb layer have adapted to the growing seasons of trees (e.g. blue bells).
- A range of human and physical factors can affect the biodiversity, they can both increase it or decrease it.
- Decrease historically for wood for fuel, clearing for agricultural land, materials for building.
- Modern day reasons include recreation (walking, horse-riding, cycling), urbanisation/house building, removal of timber, conservation and climate change.
- Physical factors include the climate (cold winter on trees when trees/plants are dormant meaning a limited availability of food), the weather e.g. wind and the relief (higher steeper slopes). These physical factors will affect the range and type of trees.

### **A03**

- Naturally, climate is a very significant factor. This plays a key role in controlling the distribution of deciduous woodlands.
- The low temperature conditions slow down the production of food in the winter. This affects both the amount and range of animal and plant species which can be supported.
- The plants and animals which occur here are adapted to the climate.
- Human factors have played a key role in the past, however they are also have a significant effect in the present. In many cases it has caused destruction, in others, humans have helped to restore and maintain biodiversity e.g. national parks.





