Physical Landscapes in the UK

Geog your memory

Title: **Geog Your Memory**

Write down as many landforms as you can see in these pictures.
Then categorise them into landforms of erosion and deposition.

Physical landscapes in the UK

9.1 The UK's relief and landscapes

1. What does relief mean?

2. The Tees-Exe line separates the UK into two parts – what is the main difference in landscapes either side of this line?

3. How does the type of rock (geology) affect landscape?

4. What type of landscape do most rivers originate from?

5. Name two upland areas and two major rivers in the UK.

Physical landscapes in the UK

9.1 The UK's relief and landscapes

1. What does relief mean?
The shape, height and steepness of the land.

2. The Tees-Exe line separates the UK into two parts – what is the main difference in landscapes either side of this line?
Main highland areas to the NW of the line – mainly lowland areas to the SE of the line.

3. How does geology affect landscape?
Harder (more resistant) rocks tend to give upland landscapes with softer rocks giving low lying and gently rolling landscapes.

4. What type of landscape do most rivers originate from?
Upland areas – hills, mountains and moors.

5. Name two upland areas and two major rivers in the UK.
Upland: Cambrian Mountains, Pennines, Lake District
Rivers: Severn, Thames, Tees

Physical landscapes in the UK - Coasts

10.1 Wave types and their characteristics

1. How are waves formed?

2. What 3 factors increase the size of waves?

3. What causes waves to break?

4. What is meant by swash and backwash?

5. Give two differences between constructive and destructive waves?

Physical landscapes in the UK - Coasts

10.1 Wave types and their characteristics

1. How are waves formed?

By the wind – friction between the air and water cause the waves to build

2. What 3 factors increase the size of waves?

- Strength of wind
- The fetch – the distance over which the wind blows
- Time – how long the wind blows for

3. What causes waves to break?

When a wave moves into shallow water (near the coast) the bottom of the wave slows down, due to friction with the sea bed. The top of the wave continues to move forward at a faster speed and so it topples over – this is called a 'breaking wave'.

4. What is meant by swash and backwash?

Swash – movement of water up the beach as a wave breaks

Backwash – movement of water back to the sea down the beach due to gravity.

5. Give two differences between constructive and destructive waves?

- Constructive have a stronger swash than backwash
- Destructive are higher and steeper
- Destructive are more frequent (smaller gaps between them)
- Destructive waves erode and destroy beaches / constructive waves deposit and build beaches

Physical landscapes in the UK - Coasts

10.2 Weathering processes and mass movement

1. Name one type of mechanical weathering and one type of chemical weathering

2. Briefly outline how weathering processes are different to erosion at the coast.

3. Explain how freeze-thaw weathering can affect a cliff.

4. What is mass movement?

5. Explain how a rotational slip (slump) happens.

6. What effects can weathering and mass movement have on a coastline?

Physical landscapes in the UK - Coasts

10.2 Weathering processes and mass movement

1. Name one type of mechanical weathering and one type of chemical weathering.

Mechanical – freeze-thaw action, salt weathering
Chemical – acid rain (carbonation)

2. Briefly outline how weathering processes are different to erosion at the coast.

Weathering is the break up (decay) of rocks usually by the action of weather (rainfall + temperature).

3. Explain how freeze-thaw weathering can affect a cliff.

Rain water gets into cracks in the rock – when temperatures drop below 0° C (freezing point for water) the water freezes – water expands as it turns to ice and this puts huge pressure on the rock and breaks it up – as this repeats the rocks are broken into smaller pieces forming scree slopes at the bottom of cliffs.

4. What is mass movement?

The downward movement of material due to gravity. Eg. a landslide or rockfall

5. Explain how a rotational slip (slump) happens.

After heavy rain, weak permeable rocks and soil become very heavy. They can then suddenly collapse along a curved surface due to the extra weight of rain water and the lubrication that the water provides – this is called a rotational slip or a slump.

6. What effects can weathering and mass movement have on a coastline?

Cliffs can collapse suddenly changing the shape of the coastline. Extra sediment is added to the coastal system and this can increase both erosion and deposition. Cliff collapse can have negative impacts on human infrastructure (roads, railways, footpaths, coastal settlements)

Physical landscapes in the UK - Coasts

10.3 Coastal marine processes (erosion, transportation, deposition)

1. Name two types of erosion and briefly define them.

2. Put the following 4 types of transportation into sediment size order (largest first)

SALTATION / SUSPENSION / TRACTION / SOLUTION

3. Write down 5 words you would use to explain longshore drift.

4. Explain why longshore drift affects some beaches more than others.

5. Explain why deposition occurs. (Give some examples of where this might happen.)

6. What factors can affect the marine processes operating along the coastline? (Hint: Think about the things that will make these processes work either faster or slower)

Physical landscapes in the UK - Coasts

10.3 Coastal marine processes (erosion, transportation, deposition)

1. Name two types of erosion and briefly define them.

Hydraulic power – the weight of water from waves smashing into the cliff
Abrasion – wearing away of the coast by the material carried in the waves
Attrition – rocks made smaller and rounder as the smash against each other in the waves

2. Put the following 4 types of transportation into sediment size order (largest first).

Traction – saltation – suspension – solution

3. Write down 5 words (or phrases) you would use to explain longshore drift.

Wave direction, swash, backwash, sediment (material), zig zag (make sure you can draw a diagram of this)

4. Explain why longshore drift affects some beaches more than others.

It depends on the angle the waves hit a beach – if a wave hits it head on then sediment is not moved along the beach, just up and down it. You need waves to hot at an angle for LD.

5. Explain why deposition occurs. (Give some examples of where this might happen.)

Deposition happens when waves lose their energy – this may be at the top of the swash with constructive waves. It can also happen is sheltered areas such as bays, estuaries, behind spits.

6. What factors can affect the marine processes operating along the coastline? (Hint: Think about the things that will make these processes work either faster or slower)

Natural: Rock type, wind direction, shape of the coastline (refraction)
Human: coastal management

Physical landscapes in the UK - Coasts

10.4 Landforms resulting from erosion

1. Name the two landforms that form together when you get bands of harder and softer rock next to each other at the coastline.

2. What other geological factors affect the rate of erosion of rock at the coast?

3. Briefly explain the formation of cliffs and wave cut platforms.

4. Put the following erosional landforms in order to show their sequence of formation:
Arch – fault (crack) – stump – cave – stack

5. What factor means that waves can attack both sides of a headland?

Physical landscapes in the UK - Coasts

10.4 Landforms resulting from erosion

1. Name the two landforms that form together when you get bands of harder and softer rock next to each other at the coastline.
- headlands (harder rocks jut out) and bays (indentations into the coast)

2. What other geological factors affect the rate of erosion of rock at the coast?
- the amount of faults in a rock – faults (cracks) are lines of weakness and these can erode faster

3. Briefly explain the formation of cliffs and wave cut platforms.
Waves attack the cliff between high and low tide mark – a wave cut notch is formed (eroded) through hydraulic power and abrasion – when the notch gets too deep the overhanging cliff above collapses due to gravity leaving a steep cliff above – this repeats and a large flat area of rock is left at the base of where the cliff once stood, this is called a wave cut platform.

4. Put the following erosional landforms in order to show their sequence of formation:
Arch - fault (crack) - stump - cave - stack
Correct order: Fault (crack) - cave - arch - stack – stump

5. What factor means that waves can attack both sides of a headland?
Refraction of waves around a headland – the shallow water around the headland actually bends the wave front around the headland so they can attack from both sides.

Physical landscapes in the UK - Coasts

10.5 Landforms resulting from deposition

1. What is deposition and why does it happen?

2. Name two landforms formed by deposition (one wave deposition and one wind deposition).

3. Put the following dune in order statrting with the one nearest the sea:
Yellow dune – embryo dune – grey dune – fore dune

4. Outline one similarity and one difference between a spit and a bar.

5. Briefly explain how and why one characteristic of sand dunes changes with distance inland from the sea.

Physical landscapes in the UK - Coasts

10.5 Landforms resulting from deposition

1. What is deposition and why does it happen?
- where eroded material is dropped in a new location either by waves or wind. It happens when the waves, or wind, no longer have the energy to carry the sediment.

2. Name two landforms formed by deposition (one wave deposition and one wind deposition).
Beach, spit, bar, sand dunes, tombolo

3. Put the following dunes in order starting with the one nearest the sea:
Yellow dune – embryo dune – grey dune – fore dune
Correct order: embryo dune – fore dune – yellow dune – grey dune

4. Outline one similarity and one difference between a spit and a bar.
Similarities: Both are land forms of deposition and created by longshore drift.
Differences: spit joins the coast at one end only.

5. Briefly explain how and why one characteristic of sand dunes changes with distance inland from the sea
- Amount of vegetation cover increases with distance from the sea – fore dunes may have only marram grass on them, grey dunes further away will have shrubs, brambles and trees. The reason for this is that there is more vegetation on the older dunes, which adds organic matter to the sand, creating soil, which allows a greater variety of pants to grow on it.

Physical landscapes in the UK - Coasts

10.6 + 10.7 Landforms at Swanage

1. Name one of the three main headlands along the Swanage Coast.

2. Name one of the bays along the Swanage Coast.

3. Explain why the Swanage coastal landscape is dominated by headlands and bays?

4. Name another landform of erosion and one of deposition along the Swanage Coast.

5. Suggest how the physical geography of Swanage bay has influenced its human use.

Physical landscapes in the UK - Coasts

10.6 + 10.7 Landforms at Swanage

1. Name one of the three main headlands along the Swanage Coast.
The Foreland, Peveril Point, Durlston Head

2. Name one of the bays along the Swanage Coast.
Swanage bay, Studland Bay, Durlston Bay

3. Explain why the Swanage coastal landscape is dominated by headlands and bays?
Due to the alternating bands of harder limestone and chalk running in bands with softer clays in between. The harder limestone and chalk erodes more slowly forming the headlands and the clays form the bays as they erode more quickly.

4. Name another landform of erosion and one of deposition along the Swanage Coast.
Erosional landforms: Old Harry Rocks (stack), The Foreland (caves, arches, cliffs, wave cut platforms)
Depositional landforms: Swanage Bay beach, Studland Heath (sand dunes and salt marsh)

5. Suggest how the physical geography of Swanage bay has influenced its human use.
- Sandy Beach in Swanage Bay attracts lots of tourist to the area
- Cliffs at the Foreland and Old Harry Rocks has a footpath for recreation and tourism as the views are stunning.
- Visitors centre and wildlife reserve on Studland Heath sand dunes – tourism and conservation

Physical landscapes in the UK - Coasts

10.8 Managing coasts – hard engineering

1. What is hard engineering?

2. Name two types of hard engineering.

3. Briefly outline how a sea wall works and what its benefits are?

4. Explain one disadvantage of groynes.

5. What are the advantages of hard engineering over soft engineering?

Physical landscapes in the UK - Coasts

10.8 Managing coasts – hard engineering

1. What is hard engineering?
Human built structures designed to protect the coast by controlling or blocking natural processes. Usually made from either concrete, rock or wood.

2. Name two types of hard engineering.
Sea wall, groynes, rock armour (rip rap), gabions

3. Briefly outline how a sea wall works and what its benefits are?
A concrete wall, often a few metres high, built to protect areas from wave attack. They usually have curved face designed to reflect the energy of the waves back out to sea..

4. Explain one disadvantage of groynes.
Groynes are designed to stop longshore drift and trap sediment making the beach wider. This stops some of the sediment travelling along the coast which starves beaches further along the coast of sediment. As these beaches get narrower the waves can erode these areas of coastline more easily.

5. What are the advantages of hard engineering over soft engineering?
- Tends to be more effective and reliable
- Starts working as soon as construction is complete
- Can be build in any location

Physical landscapes in the UK - Coasts

10.9 Managing coasts – soft engineering

1. What is soft engineering?

2. Name two types of soft engineering.

3. Briefly outline how dune regeneration works to protect the coastline?

4. What are the advantages and disadvantages of beach nourishment?

5. Why is soft engineering seen as a more sustainable option than hard engineering?

Physical landscapes in the UK - Coasts

10.9 Managing coasts – soft engineering

1. What is soft engineering?
Working with natural processes to try and protect the coast. These methods tend to be more sustainable and environmentally friendly.

2. Name two types of soft engineering.
Beach nourishment, dune regeneration, cliff re-profiling

3. Briefly outline how dune regeneration works to protect the coastline?
Planting marram grass on naturally occurring dunes helps to lock them in place as the roots hold the dune together. The dune area is then fenced off to give the marram grass time to grow. The dune is then a natural barrier between the sea and the coastal area.

4. What are the advantages and disadvantages of beach nourishment?
Advantages: works with nature so natural looking which is good for tourism and local people, relatively cheap, provides habitat for wildlife
Disadvantage: can only be used where dunes occur naturally, can be damaged in big storms, takes time to plant the marram grass and for it to grow.

5. Why is soft engineering seen as a more sustainable option than hard engineering?
As soft engineering works with nature rather than against it, it is often seen as being more environmentally friendly. For example sand dunes provide more natural habitat for wildlife than sea walls.

Physical landscapes in the UK - Coasts

10.10 Managing coasts – managed retreat

1. What is managed retreat (sometimes called managed realignment)?

2. Give an example of managed retreat.

3. Why is managed retreat seen as the best option on occasions?

4. Why is managed retreat not always a feasible option?

5. What are the negative impacts/costs of managed retreat?

Physical landscapes in the UK - Coasts

10.10 Managing coasts – managed retreat

1. What is managed retreat (sometimes called managed realignment)?
Allowing the sea to erode and flood certain areas of low value land.

2. Give an example of managed retreat.
Studland Heath at the northern end of Swanage Coast.

3. Why is managed retreat seen as the best option on occasions?
If land is of low value (eg low quality farmland, marshland etc) then it may cost more than it is worth to protect it using hard and soft engineering methods. A cost-benefit analysis is carried out before an area is identified for managed retreat.

4. Why is managed retreat not always a feasible option?
Some areas may be suitable because they are higher land that cannot be flooded. Other areas may be too valuable or important to consider being allowed to flood eg. settlements, transport routes, industry, environmentally sensitive areas etc.

5. What are the negative impacts/costs of managed retreat?
- Some land owners, such as farmers, may need to be compensated for the land they have lost.
- Rising sea levels may increase the area identified for flooding in future and put new areas at risk.

Physical landscapes in the UK - Coasts

10.11 Coastal management at Lyme Regis

1. Where is Lyme Regis?
In Dorset on the south west coast of England.

2. Why does Lyme Regis need coastal management and approximately how much has been spent on it since the 1990s?

3. Give an example of hard engineering used in Lyme Regis – include as much specific detail as possible.

4. Give an example of soft engineering used in Lyme Regis – include as much specific detail as possible

5. To what extent has the management in Lyme Regis been a success? (Hint: include some positive and negative outcomes)

Physical landscapes in the UK - Coasts

10.11 Coastal management at Lyme Regis

1. Where is Lyme Regis?

In Dorset on the south west coast of England.

2. Why does Lyme Regis need coastal management and approximately how much has been spent on it since the 1990s?

Prevailing winds from the south west mean powerful waves often hit this part of the coast. The cliffs are unstable and prone to slumping and landslides. Many houses have been lost to cliff collapse over the years and the town relies heavily on tourism so protecting the beach is important to the economy.

3. Give an example of hard engineering used in Lyme Regis – include as much specific detail as possible.

- A stone groyne was built in the middle of the bay in Lyme Regis to prevent longshore drift carrying away the beach nourishment added to the western end of the beach.

4. Give an example of soft engineering used in Lyme Regis – include as much specific detail as possible

- Beach nourishment, using sand imported from France, added to the western end of the beach in Lyme Regis Bay. This makes the beach wider which protects the town from wave eroion and also attracts tourists.

5. To what extent has the management in Lyme Regis been a success? (Hint: include some positve and negative outcomes)

Positive: New defences have protected the area well during recent powerful storms. Fewer houses being lost each year. Tourist numbers increasing.

Negative: Increased erosion along the coast to the east – conflict with other areas. Some people think defences look ugly – conflict with some locals. Less erosion means fewer fossil being uncovered by natural processes – conflict with fossil hunters. £40 million spent – could have been used on other things.

Physical landscapes in the UK – Rivers

11.1 Changes in river valleys

1. What is a drainage basin?
2. What are the three courses of the river's long profile called?
3. How is the river valley different in the upper course compared to the lower course?
4. How is the river channel different in the upper course compared to the lower course?
5. Why does the valley get wider and flatter as you move downstream?

Physical landscapes in the UK – Rivers

11.1 Changes in river valleys

1. What is a drainage basin?

The area of land that drains into one river system.

2. What are the three courses of the river's long profile called?

Upper, middle, lower

3. How is the river valley different in the upper course compared to the lower course?

V-shaped and steep sided in the upper course, very wide and flat in the lower course.

4. How is the river channel different in the upper course compared to the lower course?

Narrow, shallow and turbulent in the upper course; wide, deep and smooth flowing in the lower course.

5. Why does the valley get wider and flatter as you move downstream?

Because the river erodes a wider valley as it moves downstream as the it starts to erodes laterally (sidewards) more as meanders form. The floodplain is made flat as deposition occurs from many floods.

Physical landscapes in the UK

11.1 Changes in rivers and their valleys (additional)

1. What is the name of the line that forms the boundary around the edge of a drainage basin?

2. What is the long profile of a river?

3. What is the difference between the river valley and the river channel?

4. Give two differences between characteristics of the upper and the lower course of a river?

5. Describe how a river valley shape changes downstream.

Physical landscapes in the UK

11.1 Changes in rivers and their valleys (additional)

1. What is the name of the line that forms the boundary around the edge of a drainage basin?
Watershed

2. What is the long profile of a river?
A slice along the river showing how a river changes height above sea level from source to mouth.

3. What is the difference between the river valley and the river channel?
A river valley is a depression in the landscape that has been eroded by a river over many years. The river channel is the part of the valley with the water flowing in it.

4. Give two differences between characteristics of the upper and the lower course of a river?
Upper course is steeper relief and higher above sea level.

5. Describe how the valley shape changes downstream.
Upper course valley is steep sided and V-shaped.
Middle course has a wider and flatter valley floor, sides are less steep
Lower course has a very wide and flat valley with a wide floodplain

Physical landscapes in the UK – Rivers

11.2 Fluvial (river) processes (additional)

1. What name is given to erosion that cuts straight downwards in the upper course?

2. What name is given to erosion that acts sideways in the middle and lower course?

3. Name two different types of erosion?

4. Explain why a fast flowing river is more likely to look muddy?

5. Explain why there is more deposition of sediment in the lower course of a river?

Physical landscapes in the UK – Rivers

11.2 Fluvial (river) processes (additional)

1. What name is given to erosion that cuts straight downwards in the upper course?
Vertical erosion

2. What name is given to erosion that acts sideways in the middle and lower course?
Lateral erosion

3. Name two different types of erosion?
Hydraulic action, abrasion, attrition, solution

4. Explain why a fast flowing river is more likely to look muddy?
A fast flowing river has more energy than a slow flowing river, so it is more likely to erode sediment from the river bed and banks and then carry (transport) these eroded particles in suspension (off the river bed) making the water look muddy.

5. Explain why there is more deposition of sediment in the lower course of a river?
As a river approaches the sea it loses energy as it get closer to sea level and the gradient gets flatter. This causes the river to drop its load (deposition). The river also slows down when it hits the sea which isn't flowing.

Physical landscapes in the UK

11.2 Fluvial (river) processes

1. Name two types of river transportation and briefly define them.

2. What is the difference between abrasion and attrition? What type of process are these?

3. In which course of the river would both erosion and deposition be dominant?

4. Where along a river does deposition usually take place. Explain why

5. Briefly explain how and why sediment size changes as you move downstream.

Physical landscapes in the UK

11.2 Fluvial (river) processes

1. Name two types of river transportation and briefly define them.

Traction – rolling of larger material, such as boulders
Saltation - bouncing of medium sized material, such as pebbles
Suspension – carrying of small sediment, such as clay particles, within the flow of the river without touching the river bed
Solution – dissolved minerals within the water

2. What is the difference between abrasion and attrition? What type of process are these?

Abrasion is the wearing away of the river bed and banks by the load being carried by the river, whereas, attrition is the breaking up and rounding off of sediment particles within the river as the collide with each other.

3. In which course of the river would both erosion and deposition be dominant? Explain your answer.

In the middle course – as the river loses some energy in its middle course it starts to bend due to more lateral rather than vertical erosion. This forms meanders – the river flows fast around the outside of the bend (erosion) and more slowly on the inside of the river bend (deposition).

4. Where along a river does deposition usually take place. Explain why.

Near the river mouth - as the river hits the sea the velocity reduces significantly causing the river to lose energy rapidly and deposit its load. (Also on the inside of meanders)

5. Briefly explain how and why sediment size changes as you move downstream.

Particle size tends to reduce with distance downstream – the largest particles, such as rocks and boulders, are usually found in the upper course, with the smallest particles silt and clay usuallfound on the lower course. This is because sediment is eroded as it travels along the river, mainly due to attrition. By the time it has travelled along the river it has been eroded down into the smallest particles.

Physical landscapes in the UK

11.3 River landforms created by erosion

1. Name two landform of erosion.

2. Which course of the river are you most likely to find these landforms in?

3. Explain your answer to Q2.

4. How is a gorge different to a V-shaped valley?

5. Draw a simple annotated diagram of a waterfall briefly explaining how it forms.

Physical landscapes in the UK

11.3 River landforms created by erosion

1. Name two landform of erosion.

V-shaped valley, interlocking spurs, waterfalls, gorges

2. Which course of the river are you most likely to find these landforms in?

Upper course

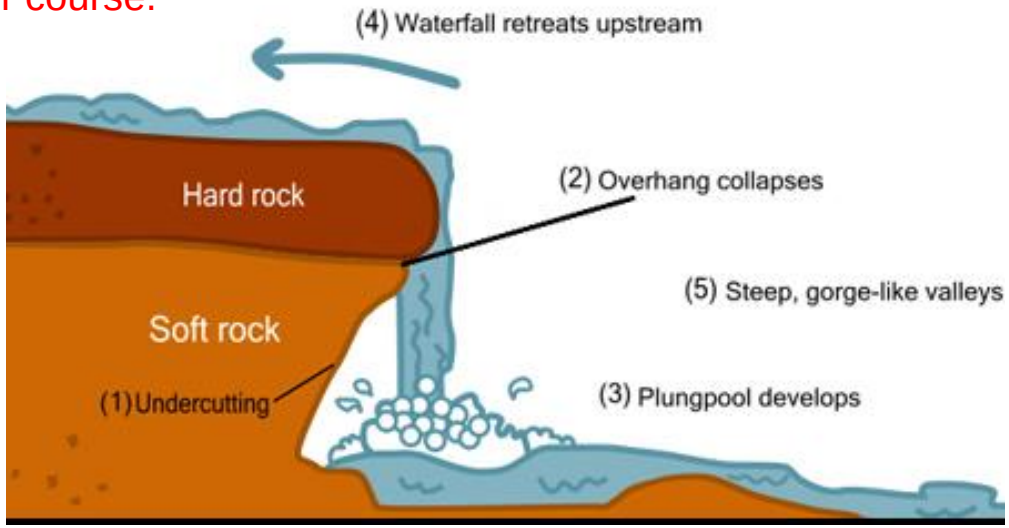
3. Explain your answer to Q2.

The upper course is the part of the river highest above sea level. the river has most potential energy here so vertical erosion is cutting downwards into the landscape creating landforms that are deep r steep sided as a result of this vertical erosion.

4. How is a gorge different to a V-shaped valley?

A gorge is a deep, vertical sided trench cut into the landscape as a waterfall retreats back upstream due to erosion of the waterfall, whereas a V-shaped valley is a steep (but not vertical) sided valley cut into the landscape by vertical erosion in the upper course.

5. Draw a simple annotated diagram of a waterfall briefly explaining how it forms.



Physical landscapes in the UK

11.4 River landforms created by erosion + deposition

1. What is the proper geographical term given to a bend in a river?

2. What landforms are created on the inside and outside of the meander?

3. Why is there more erosion on the outside of a meander?

4. What are levees and where and how do they form?

5. What is an estuary and why is there so much deposition here?

Physical landscapes in the UK

11.4 River landforms created by erosion + deposition

1. What is the proper geographical term given to a bend in a river?

A meander

2. What landforms are created on the inside and outside of the meander?

Inside bend = slip-off slope; outside bend = river cliff

3. Why is there more erosion on the outside of a meander?

The water flows faster to travel the longer distance around the outside of a river bend (meander). This gives the water more energy and it therefore erodes the bank more here.

4. What are levees and where and how do they form?

Levees are raised embankments found either side of the river channel in the lower course of a river. When a river floods here onto the wide flat floodplain the larger particles of sediment are dropped nearest to the river as they are heaviest and the river loses its energy. Over many floods these depositid particles build naturally raised embankments by the river channel.

5. What is an estuary and why is there so much deposition here?

An estuary is the area where a river meets the sea. The flow stops here as the sea stops the water moving. This causes the river to lose all its energy and it drops any sediment it is carrying here.

Physical landscapes in the UK

11.5 River landforms on the River Tees

1. What is the name of the waterfall located in the upper course of the River Tees?

2. What landform is found at Sockburn on the River Tees?

3. In which highland area of the UK is the source of the River Tees located?

4. Middlesbrough is located on the estuary of the River Tees. What landforms would yu expect to find in this part of a river?

5. How can you tell if the land is flat on an OS map?

Physical landscapes in the UK

11.5 River landforms on the River Tees

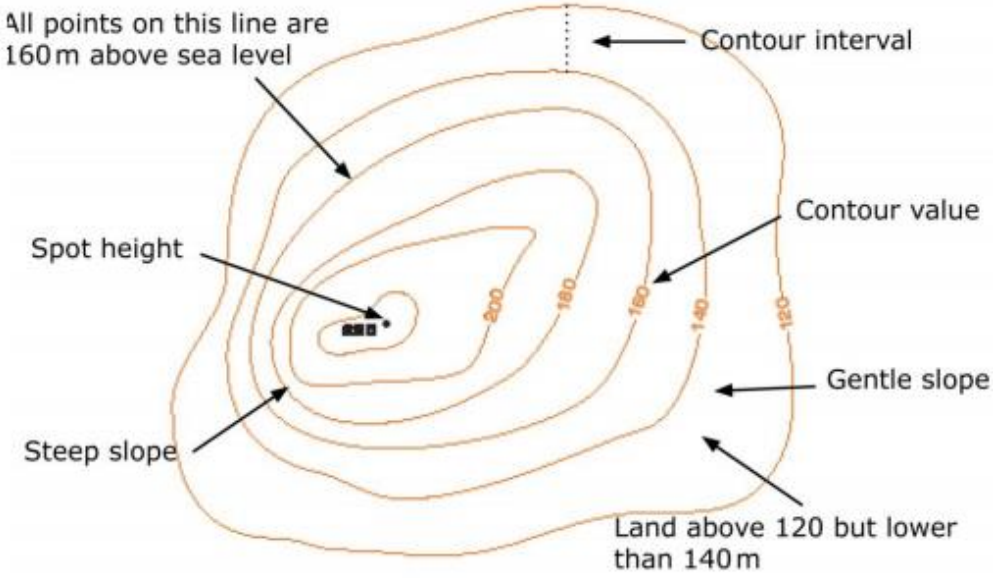
1. What is the name of the waterfall located in the upper course of the River Tees?
High Force

2. What landform is found at Sockburn on the River Tees?
A meander

3. In which highland area of the UK is the source of the River Tees located?
The Pennines

4. Middlesbrough is located on the estuary of the River Tees. What landforms would yu expect to find in this part of a river?
- Wide, flat floodplain
- Levees
- Estuary

5. How can you tell if the land is flat on an OS map?
The contour lines have wide spaces between them.



Physical landscapes in the UK

11.6 Factors increasing the risk of a river flood

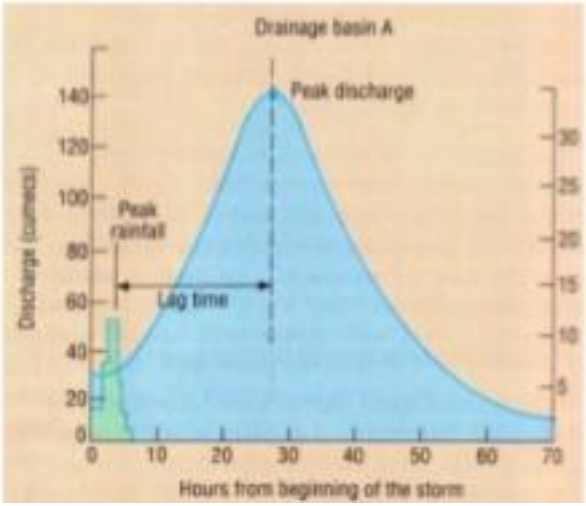
1. Name 2 physical factors that can increase flood risk.

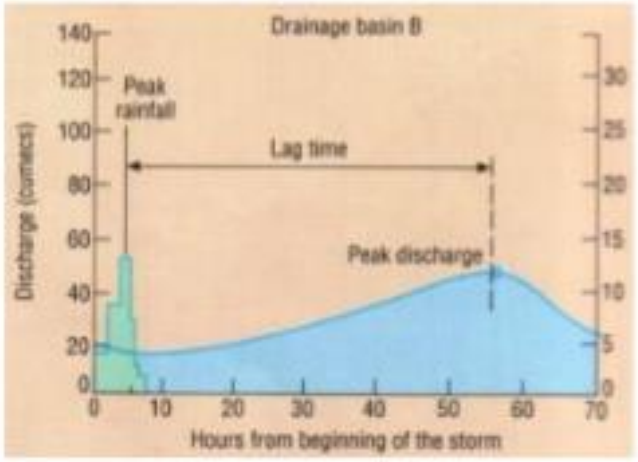
2. Name 2 human factors that can increase flood risk.

3. What is a storm hydrograph?

4. What is the lag time on a hydrograph?

5. Which hydrographs' shape is described as 'subdued' and which is 'flashy'? What does this mean and what factors can affect the shape of the hydrograph?





Physical landscapes in the UK

11.6 Factors increasing the risk of a river flood

1. Name 2 physical factors that can increase flood risk.

- High precipitation (rainfall)
- Geology – impermeable rocks increase surface run-off
- Relief – steep slopes increase surface run-off and so get water into rivers quicker

2. Name 2 human factors that can increase flood risk.

- Urbanisation – lots of impermeable surfaces (eg tarmac) and drainage systems.
- Deforesation – reduces interception by tree leaves, so allowing water to get into rivers more quickly.
- Agriculture – exposed soil and effective drainage can increase surface run-off.

3. What is a storm hydrograph?

- a graph showing the discharge of a river (in cumecs) in response to rainfall event (eg. storm). It also shows the rainfall totals.

4. What is the lag time on a hydrograph?

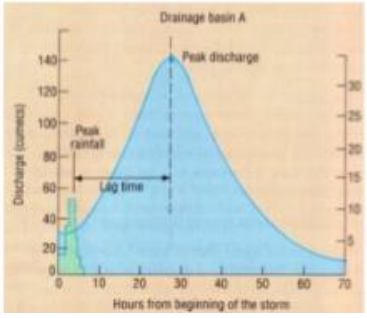
The gap in time between the peak rainfall (in mm) and the peak river discharge (in cumecs)

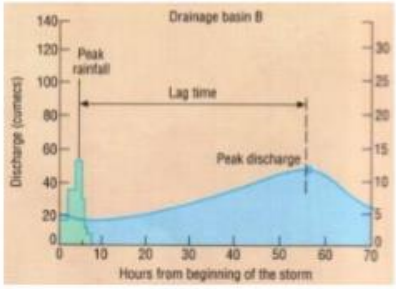
5. Which hydrographs' shape is described as 'subdued' and which is 'flashy'? What does this mean and what factors can affect the shape of the hydrograph?

A = flashy and B = subdued

- Flashy means water gets into river quickly meaning a short lag time.

Factors: rock type; relief (steepness of land); size of drainage basin; land use; antecedent rainfall (previous rain); rainfall intensity





Physical landscapes in the UK

11.7 Managing floods – hard engineering

1. What is hard engineering?

2. Name two types of hard engineering use to manage flooding

3. Outline how dams and reservoirs manage flooding

4. Identify the advantages of this strategy

5. Identify the disadvantages of this strategy

Physical landscapes in the UK 11.7 Managing floods – hard engineering

1. What is hard engineering?

Hard engineering involves using artificial structures to prevent or control flooding. (It is usually more expensive)

2. Name two types of hard engineering use to manage flooding

Dams and reservoirs, channel straightening, embankments, flood relief channels, dredging to increase channel capacity.

3. Outline how dams and reservoirs manage flooding

Reservoirs hold large amounts of water, the dam controls and regulates the flow of the water. Water will on be released if it is safe to do so

4. Identify the advantages of this strategy

Reservoirs can be used for recreational activities such as sailing, they can also store water which can be transported elsewhere, the dam can be used to generate electricity (Hydro electric power HEP)

5. Identify the disadvantages of this strategy

Very expensive to build, requires a large amount of space which have to be flooded, dam failure can have huge consequences

*** Make sure know the advantages and disadvantages of the other strategies also**

Physical landscapes in the UK

11.8 Managing floods – soft engineering

1. What is soft engineering?

2. Name two types of soft engineering used to manage flooding?

3. Outline how afforestation is used to manage flooding

4. Identify the advantages of this strategy

5. Identify the disadvantages of this strategy

Physical landscapes in the UK

11.8 Managing floods – soft engineering

1. What is soft engineering?

Soft engineering involves working with natural processes to manage flood risk. It aims to reduce and slow down the movement of water

2. Name two types of soft engineering used to manage flooding?

Afforestation (planting trees), wetlands and flood storage areas, floodplain zoning, river restoration

3. Outline how afforestation is used to manage flooding

Trees slow down the movement of water getting to the river, as they intercept rain, as well as absorbing water from the ground.

4. Identify the advantages of this strategy

This is a relatively cheap method and has other environmental benefits such as providing wildlife habitats

5. Identify the disadvantages of this strategy

It takes a long time for trees to grow and you need a lot of trees and space if you are going to make an impact on the drainage basin.

Physical landscapes in the UK

11.9 Managing floods case study: Banbury

1. What is the name of the river that flows through Banbury?

River Cherwell

2. How much did the flood defences finished in Banbury in 2012 cost and how much value (homes and businesses) does it protect?

Cost = £20 million

Benefit = £100 million

3. Give one element of hard engineering and one soft engineering used in the scheme.

Hard: 3km flood embankment to protect the M40 motorway and the railway line.

Hard: raised A361 will prevent this main road from flooding (it crosses the floodplain)

Soft: flood storage area and wetland creation – allows the flood water to remain on the floodplain rather than channelling it back into the river and increasing flooding downstream in Banbury.

4. What social benefits does the scheme bring?

Roads and railway line will flood less so less disruption to peoples lives (eg. getting to work – locally and nationally)

Better quality of life with paths and cycle ways around the new wetland conservation area

5. What environmental benefits does it bring?

The wetland created as part pf the flood storage area is part of a Biodiversity Action Plan – more wildlife such as birds and insects.

Extra trees and p;lant will remove CO2 from the atmosphere and contribute to reducing carbon emissions.

Explain the formation of sand dunes. (4 marks)