

3.1a: What is a landscape?

A landscape is made up of five 'elements' PHWLT. Most are natural, some are human. The 'W' stands for water (eg rivers & lakes)

Landscape Elements

Physical	Living
<ul style="list-style-type: none"> Mountains Coastlines Rivers 	<ul style="list-style-type: none"> Vegetation Habitats Wildlife
Human	Transitory
<ul style="list-style-type: none"> Buildings Infrastructure Structures 	<ul style="list-style-type: none"> Weather Smells Sounds/Sights

3.1b: [D] Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

Key	
Lowlands	
Uplands/Highlands	



Areas +600m: peaks and ridges; cold, misty and snow common. i.e. Scotland

Areas -200m: Flat or rolling hills. Warmer weather. i.e. Fens/Downs

3.2a: [P] Erosion

The break down and transport of sediment [rocks] – smoothed, rounded and sorted as they go.

Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks eg salt crystals in sea water.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the faults/cracks to expand.

3.2a: [P] Transportation

A natural process by which eroded material is carried/transported.

Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is held and carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

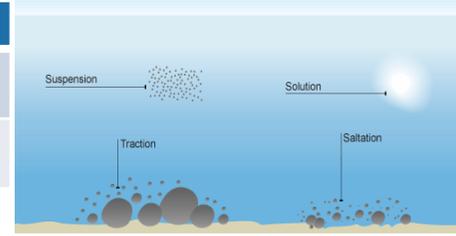
3.1b: [P] Glaciation in the UK

Over many thousands of years, glaciation has made an impression on the UK's landscape. Today, much of upland Britain is covered in u-shaped valleys and eroded steep mountain peaks.

During the ice age	
Ice covered most areas. Glaciers eroded and weathered landscapes to create dramatic mountain scenery.	
After the ice age	
Deep valleys and deposition of sediment revealed	

3.1b: [Ch] Human activity on Landscape

Farming has changed the vegetation which grows there.	Much of the rural landscape has been replaced by urban sprawl.	Infrastructure such as roads and pylons cover most of the UK.
Over thousands of years, much of the UK's woodlands have gone.	Increasing population of the UK means more houses are needed.	UK's marshes and moorlands are heavily managed by people.



3.1b: [Ch] Geology of the UK

The UK is made from a variation of different rock types. The varied resistance of these rocks influences the landscape above.

Igneous Rock Volcanic/molten rock brought up to the Earth's surface and cooled into solid rock.	
Sedimentary Rock Made from broken fragments of rock worn down by weathering on Earth's surface.	
Metamorphic Rock Rock that is folded and distorted by heat and pressure.	

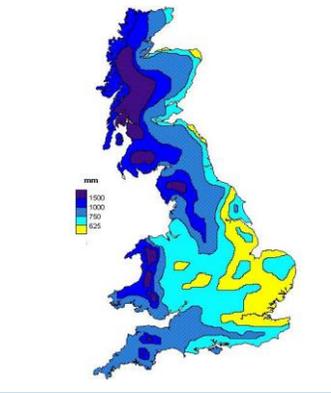
Topic 3 Distinctive Landscapes

3.1b: [Ch] Climate and Weather in the UK

The variations of climate and weather means there are different influences on the UK's landscape.

3.1b: Climate	3.2a: [P] Weathering – in situ breakdown of rock
The rainfall map of the UK shows variations in average rain. <ul style="list-style-type: none"> Less precipitation occurs in low land areas. East England Most precipitation occurs in upland areas (Scot; Wales; NW England) <p>These differences mean... Uplands experience more weathering, erosion and mass movement.</p>	<p>Mechanical Caused by the physical action of rain, frost and wind.</p> <p>Chemical Action of chemicals within rain dissolving the rock.</p> <p>Biological Rocks that have been broken down by living organisms eg plants & animals</p>

Average rainfall in the UK

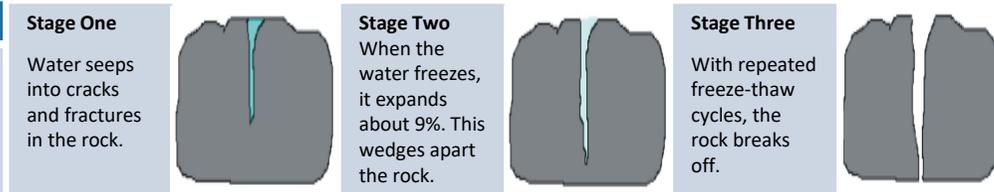


3.2a: [P] Mass Movement

A large movement of soil and rock debris that moves down a slope in response to the pull of gravity in a vertical direction.

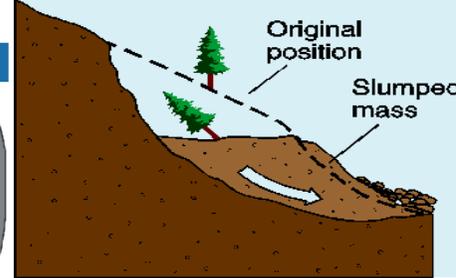
1	Rain saturates the permeable rock above the impermeable rock making it heavy.
2	Waves or a river will undercut [erode] the base of the slope making it unstable.
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
4	The debris at the base of the cliff is then removed and transported by waves or river.

3.2a: [P] Freeze-thaw weathering



3.1b: [Ch] Soil & Landscape

*Soils are created from weathered rocks, organic material and water. Rock types influence soil fertility (how many minerals & nutrients).
*Low-lying areas such as the Cambridgeshire Fens have deep soil whereas uplands have thin soil.
*Deep soil is more often associated with deciduous woodland rather than coniferous woodlands. Deep soil better for plants and holds more water



3.2a: [P] Deposition

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

3.2a [Coast] processes make landforms - Formation of Coastal Stack



- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below –arch collapses leaving stack.
- 6) Further weathering and erosion leaves a stump.

3.2b: [M] Coastal Defences aka management

Hard Engineering Defences – some key examples

Groynes	Wood barriers prevent/slow longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
[curved] Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> ✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Rip Rap	Giant boulders protecting cliffs	<ul style="list-style-type: none"> ✓ Long life span ✗ Very expensive
Gabions	Cages of rocks/boulders absorb the waves energy, protection the cliff behind.	<ul style="list-style-type: none"> ✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

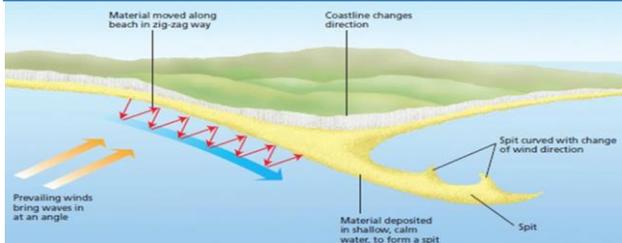
Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> ✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas left to flood and erode naturally.	<ul style="list-style-type: none"> ✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

3.2a [Coast] processes make landforms: Bays and Headlands



- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition.
- 3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

3.2a [Coast] processes make landforms - Spits - Deposition

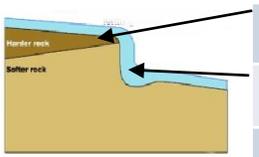


- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

3.2a [Riv]: Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow V shaped valleys.

3.2a [Riv] processes make landforms: Upper Course: Waterfalls & Gorges

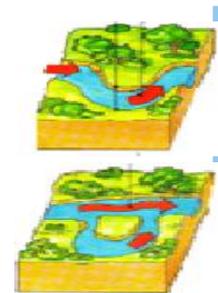


1. River flows over alternative types of rocks.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Soft rock is undercut leaving unsupported rock which collapses.
- 5) Waterfall retreats leaving steep sided gorge.

3.2a [Riv] Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

3.2a: [Riv] Processes make landforms: Middle Course: Ox-bow Lakes & Meanders



- Step 1**
- Erosion of outer bank forms river cliff. Deposition on inner bank forms slip off slope.
- Step 3**
- Erosion breaks through neck, river takes the fastest route, redirecting flow

- Step 2**
- Further hydraulic action and abrasion of outer banks, neck gets smaller.
- Step 4**
- Continued deposition cuts off the main channel leaving an oxbow lake.

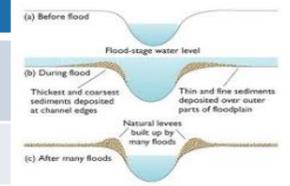
3.2a [Riv] Lower Course of a River

Near the mouth, the river is wider and flatter. Transported material is mostly deposited here.

3.2a [Riv] Lower course landforms: Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials builds up over time to form natural levees.

Nutrient rich soil makes it ideal for farming. People like to live next to rivers, the flat land is tempting to build on, but not a great idea!



3.2b: [M] River Management Schemes

Soft Engineering	Hard Engineering
<p>Afforestation – plants & trees soak up rainwater, reduces flood risk.</p> <p>Managed Flooding – naturally let areas flood, protect settlements often called LAND USE ZONING</p>	<p>Straightening Channel – increases velocity to remove flood water.</p> <p>Artificial Levees – heightens river so flood water is contained.</p> <p>Deepening or widening river to increase capacity for a flood.</p>

3.2b: Coastal Case Study: The Jurassic Coast

Location and Background
Located along the South coast in the counties of Devon & Dorset. The coastline extends 155km from Exmouth in the West to Poole in the East.

Geomorphic Processes
-the coastline is made up of alternating layers of sedimentary rock. On the concordant (south) coast, coves (eg Lulworth) and beaches (Chesil) form, whereas on the discordant (east) coast, headlands, bays, beaches, arches and stacks form.

Future: heavy storms batter the coastline. This is likely to worsen in future due to climate change inc sea level rise.

Management
-Rapid erosion in some areas means there are a number of different management schemes (H&S engineering).
-High population centres such as Swanage and Lyme Regis are protected by 'hold the line' defence measures such as sea walls, groynes & heavy beach nourishment.
-Underpopulated &/or limited economic value areas, such as farmland, are under 'managed retreat' schemes.

3.2b: River Case Study: The River Severn

Location and Background
Located in Wales/Central England it flows 354km from the Plynlimon Hills in Wales to the Bristol Channel.

Geomorphic Processes
Upper – Features include V-Shaped valley, rapids and waterfalls. Alternating bands of hard & soft rock have formed a gorge @ Ironbridge.
Middle – Features include meanders and ox-bow lakes. The incised meander near Shrewsbury encloses the town.
Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Management
-Towns such as Shrewsbury and Bewdley are economically and socially important due to houses and jobs. Range of H&S engineering in place there
-Dams and reservoirs in the upper course, control river's flow during high & low rainfall.
- Flood warning systems, land use zoning and river straightening reduce impacts of flooding. Demountable barriers used @ Shrewsbury & Ironbridge.