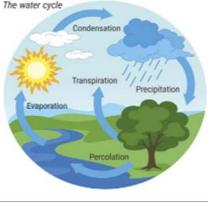
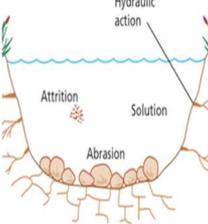
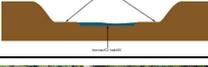
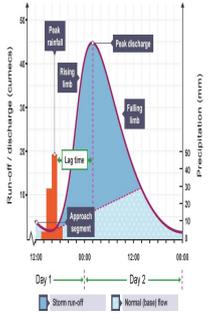
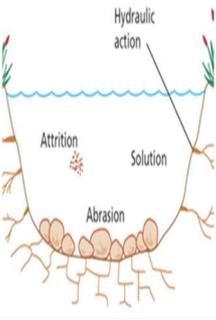


## The Knowledge – Physical Landscapes – Rivers

Subtopic	Key knowledge/processes	Diagram
<b>Hydrological / Water Cycle</b>	<ol style="list-style-type: none"> <li><b>Evaporation</b> → Water vapour rises.</li> <li><b>Transpiration</b> → Evaporation from trees.</li> <li><b>Condensation</b> → Water cools into cloud.</li> <li><b>Precipitation</b> → Clouds release rain.</li> <li><b>Surface run-off</b> → Water flows on ground.</li> <li><b>Groundwater flow</b> → Water underground.</li> </ol>	 <p>The water cycle diagram shows the sun causing evaporation from the ocean and transpiration from a tree. Water vapor rises and condenses into clouds. Precipitation falls as rain over the ocean and land. On land, water flows as surface run-off into a river or infiltrates the ground as percolation to become groundwater.</p>
<b>Drainage Basin System (DBS)</b>	<ol style="list-style-type: none"> <li><b>Watershed</b> → Boundary between two DBS.</li> <li><b>Source</b> → Point where river begins.</li> <li><b>Tributary</b> → Small river than joins larger one.</li> <li><b>Confluence</b> → Point where two rivers meet.</li> <li><b>Mouth</b> → Point where river meets the sea.</li> </ol>	 <p>The diagram shows a network of rivers starting from a source, with smaller tributaries joining a larger river. The confluence is where two rivers meet, and the mouth is where the river meets the sea.</p> <p style="text-align: center;"><b>Drainage Basin Features</b></p>
<b>Fluvial Processes</b>	<ol style="list-style-type: none"> <li><b>Erosion</b> → Removal of material by water (ie: hydraulic action, abrasion, attrition, solution).</li> <li><b>Weathering</b> → Breakdown of rock by day-to-day changes in atmosphere (ie: freeze-thaw action).</li> <li><b>Transportation</b> → Material carried by the river (ie: traction, suspension, saltation, solution).</li> <li><b>Deposition</b> → Material dropped by river as low energy. Heaviest to lightest.</li> </ol>	 <p>The diagram illustrates how water erodes a river bed. Hydraulic action is the force of water against the banks. Attrition is the rubbing of rocks together. Solution is the chemical weathering of rocks. Abrasion is the sanding of the bed by rocks.</p>
<b>River Characteristics</b>	<ol style="list-style-type: none"> <li><b>Long profile</b> → Shows gradient of river.</li> <li><b>Cross profile</b> → Shows shape of valley.</li> </ol>	 <p>The diagram shows a cross-section of a river valley with the river channel in the center and the valley floor sloping down to the banks.</p>
<b>Upper Course</b>	<ol style="list-style-type: none"> <li><b>Features</b> → Steep valley, narrow/shallow river channel, fast flowing water.</li> <li><b>Erosion</b> → Vertical = v-shaped valley.</li> <li><b>Erosional landforms</b> → Interlocking spurs, waterfalls, gorges.</li> </ol>	 <p>A photograph showing a waterfall cascading down a steep, rocky cliff face in a narrow valley.</p>
<b>Middle Course</b>	<ol style="list-style-type: none"> <li><b>Features</b> → Gentle gradient, shallow valley, less turbulence, less friction.</li> <li><b>Erosion</b> → Lateral = wider/deeper river channel.</li> <li><b>Erosional and depositional landforms</b> → Meanders, Ox-bow lakes.</li> </ol>	 <p>A photograph of a river with several meanders winding through a wide, green valley.</p>
<b>Lower Course</b>	<ol style="list-style-type: none"> <li><b>Features</b> → Very gentle gradient, wider open valley floor.</li> <li><b>Erosion</b> → Lateral = widest/deepest part of river.</li> <li><b>Depositional landforms</b> → Estuary, floodplains, levees.</li> </ol>	 <p>A photograph of a wide river estuary with a large, flat floodplain and some marshy areas.</p>
<b>Case Study: River Severn</b>	<ol style="list-style-type: none"> <li><b>Location</b> → Longest river in UK. Source in mid Wales in Plinlimon Hills. Estuary near Bristol and Gloucester.</li> <li><b>Course</b> → V-shaped valley = rapids/waterfalls in upper course. Meanders/ox-bow lakes in middle course. Estuary 2<sup>nd</sup> largest tide in world (19m) in lower course.</li> <li><b>Management</b> → Urbanisation increase flood risk. Dams and reservoir have built. Monitory systems have improved.</li> </ol>	 <p>A map of the River Severn basin, showing its source in Wales and its course through England to the Bristol and Gloucester estuary. Key features like the Plinlimon Hills and various towns are marked.</p>
<b>Storm Hydrographs</b>	<ol style="list-style-type: none"> <li><b>Definition</b> → Show how a river changes after a storm and can be used to predict floods.</li> <li><b>Flood</b> → Occurs when river discharge is greater than channel's capacity.</li> <li><b>Discharge</b> → Volume of water in river channel.</li> <li><b>Peak discharge</b> → Highest level of discharge.</li> <li><b>Peak rainfall</b> → Highest amount of rainfall.</li> <li><b>Lag time</b> → Delay between peak rainfall &amp; discharge. Short = high flood.</li> <li><b>Rising limb</b> → Increasing river discharge</li> <li><b>Falling limb</b> → Decreasing river discharge.</li> </ol>	 <p>The graph plots discharge (cubic metres) on the left y-axis and precipitation (mm) on the right y-axis against time. It shows a sharp peak in precipitation followed by a rising limb of discharge, a peak discharge, and a falling limb. Key features like 'Peak rainfall', 'Rising limb', 'Peak discharge', 'Falling limb', and 'Lag time' are labeled.</p>
<b>Causes of Flooding</b>	<ol style="list-style-type: none"> <li><b>Physical</b> → Rainfall intensity, geology, relief, size of DBS, soil moisture.</li> <li><b>Human</b> → Land use (ie: urbanisation/tarmac reduces infiltration into soil).</li> </ol>	

<b>Management Hard Engineering</b>	<ol style="list-style-type: none"> <li><b>Dam &amp; reservoir</b> → Use to regulate flow of the river.</li> <li><b>Channel straightening</b> → Speeds up flow of the river.</li> <li><b>Embankments</b> → Raising banks to increase capacity = man-made levees.</li> <li><b>Flood relief channels</b> → Diverts water.</li> </ol>	
<b>Management Soft Engineering</b>	<ol style="list-style-type: none"> <li><b>Afforestation</b> → Planting trees along river.</li> <li><b>Wetlands</b> → Land next to river allowed to flood.</li> <li><b>Floodplain zoning</b> → Land has different uses according to risk of flooding.</li> <li><b>River restoration</b> → Return river to original course reduces risk.</li> <li><b>Planning</b> → Monitor river to assess risk of flooding.</li> </ol>	
<b>Case Study: Boscastle</b>	<ol style="list-style-type: none"> <li><b>Location</b> → North Cornwall, UK.</li> <li><b>Date</b> → August 2004, 7 inches of water fell in a few hours resulting in discharge of 140 cumecs.</li> <li><b>Causes</b> → Steep valley sides, high relief rainfall, confluence, urbanisation, deforestation.</li> <li><b>Impacts</b> → 80 homes/businesses destroyed, 50 cars into sea, sewage burst.</li> <li><b>Management</b> → Channelisation, bridge widened, car park moved, banks raised, overflow channel, gauges installed.</li> </ol>	

### The Knowledge – Physical Landscapes – Coasts

<b>Subtopic</b>	<b>Key knowledge/processes</b>	<b>Diagram</b>
<b>UK Physical Landscape</b>	<ol style="list-style-type: none"> <li><b>Upland</b> → North West Scotland, 600m+ peak and ridges, cold, misty, snow.</li> <li><b>Lowland</b> → South East England (Fens), 200m hills, warmer weather, dry.</li> </ol>	
<b>Waves Types</b>	<ol style="list-style-type: none"> <li><b>Constructive</b> → Swash stronger than backwash. Builds coastline.</li> <li><b>Destructive</b> → Backwash stronger than swash. Erodes coastline.</li> </ol>	
<b>Coasts Processes</b>	<ol style="list-style-type: none"> <li><b>Erosion</b> → Removal of material by water (ie: hydraulic action, abrasion, attrition, solution).</li> <li><b>Mass movement</b> → Rockfall, Landslide/Mudflow, Rotational Slip/Slumping.</li> <li><b>Weathering</b> → Mechanical (ie: freeze-thaw action), Chemical (ie: carbonisation), Biological (ie: burrowing animals).</li> <li><b>Transportation</b> → Material carried by waves (ie: traction, suspension, saltation, solution). Longshore drift carries sediment along beach in zig-zag.</li> <li><b>Deposition</b> → Material dropped by waves as they lose energy. Heaviest at the back of the beach.</li> </ol>	
<b>Geology / Rock Type</b>	<ol style="list-style-type: none"> <li><b>Discordant coastline</b> → Alternation between bands of hard/soft rock.</li> <li><b>Concordant coastline</b> → Coastline that has only one type of rock.</li> </ol>	
<b>Erosion</b>	<ol style="list-style-type: none"> <li><b>Landforms</b> → Headlands and bays, cliffs and wave-cut platforms, caves, arches, stacks, and stumps.</li> </ol>	
<b>Deposition</b>	<ol style="list-style-type: none"> <li><b>Landforms</b> → Beaches, sand dunes, spit, bars, and tombolos.</li> </ol>	
<b>Management Hard Engineering</b>	<ol style="list-style-type: none"> <li><b>Groynes</b> → Wood barriers that prevent longshore drift and build beach.</li> <li><b>Sea walls</b> → Concrete walls break up the energy of waves.</li> <li><b>Gabions</b> → Cages of rock/boulders that absorb the energy of waves.</li> <li><b>Rock armour / rip rap</b> → Barrier of rock/boulders at the back of beach.</li> </ol>	
<b>Management Soft Engineering</b>	<ol style="list-style-type: none"> <li><b>Beach nourishment</b> → Build-up of sand on beach to increase protection.</li> <li><b>Managed retreat</b> → Low value areas of coast are left to erode over time.</li> <li><b>Sand dunes</b> → Natural barrier that protects cliffs from erosion.</li> </ol>	
<b>Case Study: Porlock and Minehead</b>	<ol style="list-style-type: none"> <li><b>Porlock Village</b> → Groynes. No maintenance. High costs. Increase sediment further down coastline (Porlock Marsh). Lower value land.</li> <li><b>Porlock Marsh</b> → Managed retreat. Salty marsh. Low value land.</li> <li><b>Minehead</b> → Sea wall, rock armour, groynes. High value land.</li> </ol>	