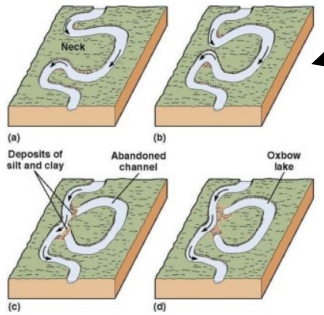
GEOGRAPHY 7.3. RIVERS

3. Erosion processes

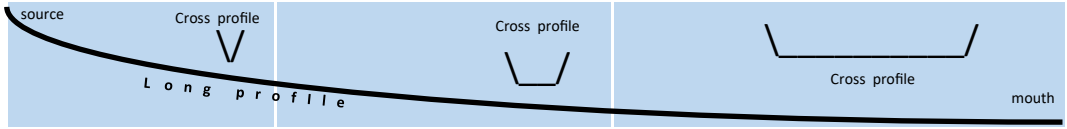
The break down and transport of rocks – smooth, round and sorted.	
Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks.
Abrasion	**Rocks scrapped along the banks and bed my the flowing water.**
Hydraulic Action	**Powerful flow of water blasts off loose rocks, stones and fine silt from the rive banks and bed.**



Rivers key terms

Drainage basin watershed long profile cross profile erosion hydraulic action abrasion attrition solution deposition Valley source confluence tributary waterfall rapids V-shape valley interlocking spurs gorge meander river cliff river beach oxbow lake mouth channel flood plain levee gradient banks flood discharge Carrying capacity load Hard engineering dam bunds reservoir channelization soft engineering afforestation land-use zoning flood alerts

1. and 2. The Long and Cross Profiles and summary of features of the river



UPPER COURSE

Steep gradient leads to a fast flowing rivers that cuts into the land—**eroding** it. Here, you find V-shape valleys, waterfalls and gorges.

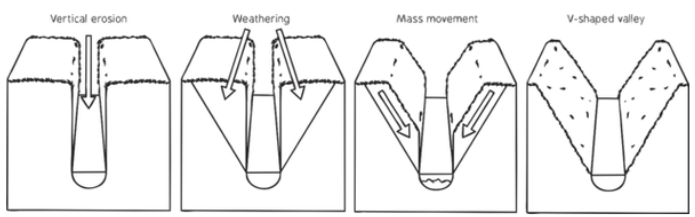
MIDDLE COURSE

The **gradient decreases** so erosion power decreases and the rivers begins to **deposit** material carried down from upstream. Here, you find narrow flood plains and meanders.

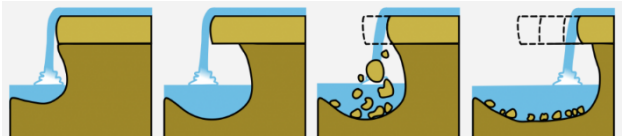
LOWER COURSE

The **gradient is very shallow** now, so although the river is larger as more tributaries have joined it, it no longer erodes, and instead creates huge flood plains and levees. When the river is affected by the tide near the mouth, estuaries form.

4. Upper Course River Features —V-shape valleys and waterfalls



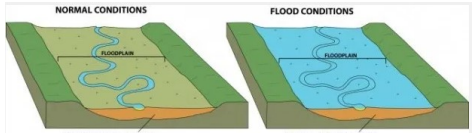
Key learning: river water cuts vertically into the land in the upper course. Waterfalls occur where the river bed changes from a more resistant rock to a softer rock, so the river can continue cutting vertically into the land—forming a drop-off.



5. and 6. Middle Course River Features — Meanders and Oxbow lakes

Key learning: In the mid-course, erosion continues but now does so horizontally (laterally) across the flat ground of the flood plains where water moves quickly around the outside of bends meanders in the river. However, the river transports eroded material downstream and begins to deposit material along the middle course when moving slowly—this builds floodplains.

Source	The beginning of a river	Long profile	The shape of the river's journey from source to mouth
Mouth	Where a river flows into the sea or lake	Cross profile	The shape of land across the river valley
Tributary	Another river that joins the main river	Gradient	The angle of the ground the river flows over
Watershed	The edge of the drainage basin	Erosion	The breakdown and removal of material
Drainage Basin	The area of land a river system drains	Deposition	Material put down by the river when it loses energy
Confluence	Where a tributary joins the main river	channel	The riverbed and banks that the water flows on/in.



7. Lower Course

Key learning: The lower course is all about deposition of the material it has carried downstream towards the mouth. Tides can affect the lower course creating estuaries.

8. Flood Defences: Using Hard and Soft Engineering to protect settlements

Hard Engineering	**Dams** Huge walls built across valleys holding back massive amounts of water in reservoirs; the ultimate flood defence.	**Bunds (raised levees)** Earth banks built up (sometimes with vertical walls buried within) on the banks to increase carrying capacity of water in the river.	**Channelisation** Straightening the rivers and making the banks vertical to increase river velocity to move on the flood water downstream.
Soft Engineering	**Afforestation** Tree planting in the drainage basin to increase interception and absorption of rain water to slow down potential flooding..	**Land Use Zoning** Setting aside flood-prone land in settlements for grazing animals, sports pitches and allotments to prevent major damage to property when rivers flood.	**Warning Systems** Public advice (news and social media) with warning systems to save properties and lives in the event of a flood occurring.