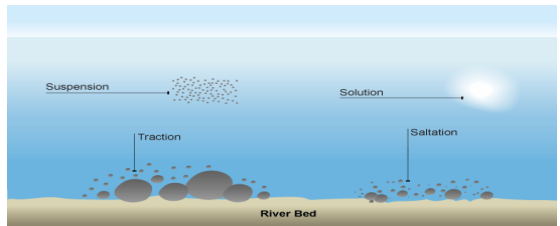


Types of Erosion	
The break down and transport of rocks – smooth, round and sorted.	
Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Types of Transportation	
A natural process by which eroded material is carried/transported.	
Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is 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.

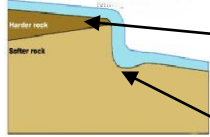
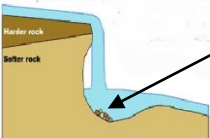
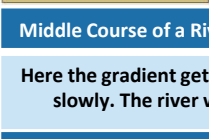
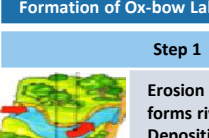

Types of Weathering	
Weathering is the breakdown of rocks where they are.	
Carbonation	Breakdown of rock by changing its chemical composition.
Mechanical	Breakdown of rock without changing its chemical composition.



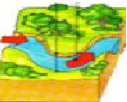
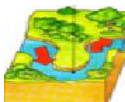


What is Deposition?
When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Water Cycle Key Terms	
Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.
Physical and Human Causes of Flooding.	
Physical: Prolong & heavy rainfall Long periods of rain causes soil to become saturated leading runoff.	Physical: Geology Impermeable rocks causes surface runoff to increase river discharge.
Physical: Relief Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	Human: Land Use Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

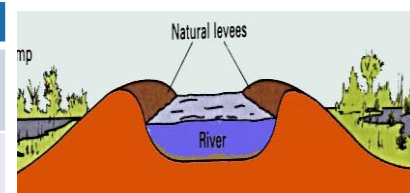
Upper Course of a River
Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall	
	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) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
	5) Waterfall retreats leaving steep sided gorge.

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.

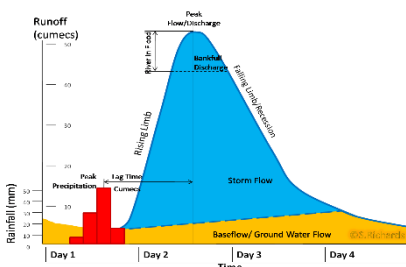
Formation of Ox-bow Lakes	
Step 1	Step 2
	
Step 3	Step 4
	

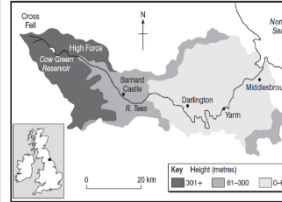
Lower Course of a River	
Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.	
Formation of Floodplains and levees	
When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.	
✓ Nutrient rich soil makes it ideal for farming.	✓ Flat land for building houses.



River Management Schemes	
Soft Engineering	Hard Engineering
Afforestation – plant trees to soak up rainwater, reduces flood risk. Demountable Flood Barriers put in place when warning raised. Managed Flooding – naturally let areas flood, protect settlements.	Straightening Channel – increases velocity to remove flood water. Artificial Levees – heightens river so flood water is contained. Deepening or widening river to increase capacity for a flood.

Hydrographs and River Discharge
River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. Peak discharge is the discharge in a period of time.	
2. Lag time is the delay between peak rainfall and peak discharge.	
3. Rising limb is the increase in river discharge.	
4. Falling limb is the decrease in river discharge to normal level.	

Case Study: The River Tees	
Location and Background Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.	
Geomorphic Processes Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed. Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town. Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.	
	
Management - Towns such as Yarm and Middlesbrough are economically and socially important due to houses and jobs that are located there. - Dams and reservoirs in the upper course, controls river's flow during high & low rainfall. - Better flood warning systems, more flood zoning and river dredging reduces flooding.	