

Physical processes:

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.

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.

Mass Movement

A large movement of soil and rock debris that moves down slopes 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 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.

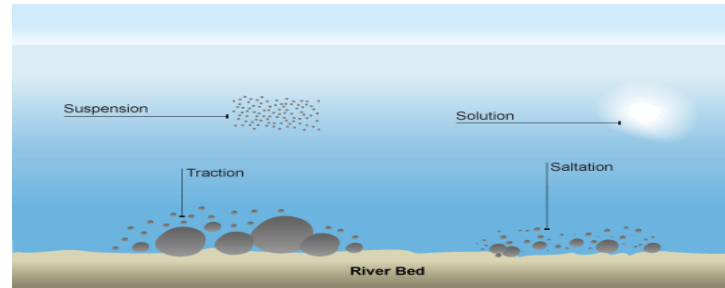


YEAR 7 RIVER LANDSCAPES

Types of Weathering

Weathering is the breakdown of rocks where they are.

CHEMICAL	Breakdown of rock by changing its chemical composition.
PHYSICAL	Breakdown of rock without changing its chemical composition.
BIOLOGICAL	The action of plants or animals breaking apart the rock or soil.



Mechanical Weathering Example: Freeze-thaw weathering

Stage One

Water seeps into cracks and fractures in the rock.



Stage Two

When the water freezes, it expands about 9%. This wedges apart the rock.



Stage Three

With repeated freeze-thaw cycles, the rock breaks off.



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.

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.

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.

Middle Course of a River

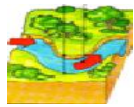
Here the gradient gets gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

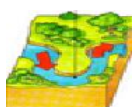
Formation of Ox-bow Lakes

Step 1



Erosion of outer bank forms river cliff. Deposition on inner bank forms slip off slope.

Step 2



Further hydraulic action and abrasion of outer banks, neck gets smaller.

Step 3



Erosion breaks through neck, so river takes the fastest route, redirecting flow

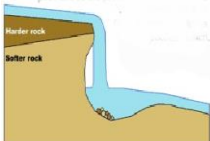
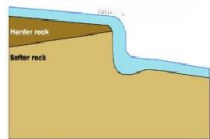
Step 4



Evaporation and deposition cuts off main channel leaving an oxbow lake.

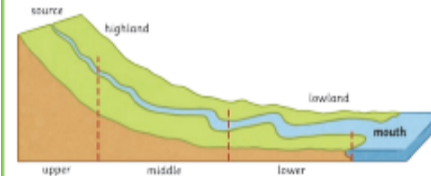
Formation of a Waterfall

- 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.



The long profile of a river shows how the gradient of the land changes as the river travels downstream.

The cross profile of the river shows the cross-section of the river and the river valley.

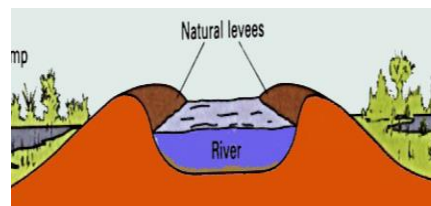


	Upper Course	Middle Course	Lower Course
Gradient	Steep gradient	more gentle gradient	Flat gradient
Velocity	Low velocity	Faster velocity	Fastest velocity
Features	Waterfalls, gorges, and rapids	Meanders, Ox bow lakes, floodplains	Floodplains, deltas, estuaries
Channel	Narrow and shallow channel	Wider and deeper channel	Widest and deepest channel

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.



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.

River Management Schemes

Soft 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.

Hard Engineering

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.