OGUN DIGICLASS

- **SUBJECT:** GEOGRAPHY
- **CLASS:** SENIOR SECONDARY SCHOOL
- **TOPIC:** ACTION OF RUNNING WATER (RIVERS)

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ACTION OF RUNNING WATERS (RIVERS)

Running water is one of the most important agents of denudation. Rivers are involved in erosion, transportation and deposition of materials.

TERMS ASSOCIATED WITH RIVERS

1. **Source of a river:** the source of a river refers to where a river starts or begins, usually around highlands.
2. **Course of a river:** this refers to the path or channel through which the river flows.
3. **Mouth of a river:** this refers to where the river ends or where it enters into the sea, ocean or lake

Other Terms Associated with Rivers

4. River basin or Catchment Area: This refers to all the areas drained by a river and its tributaries

5. Water shed or water divide: This refers to the highland area which separates two or more rivers or two river basins. It is from the water shed that rivers take their sources

6. River regime: This refers to the seasonal changes in the volume of water in a river in a year. It could be single regime where there is one period of high volume and one period of low volume, and the double regime where there are two distinct periods of high volume in a year Knowledge of a river regime is important to man in controlling possible floods, storing up water for irrigation and human consumption,and for planning hydro-electricpower production,

Other Terms Associated with Rivers

7. Confluence of a river: This refers to the meeting point of two different rivers.

8. Tributaries: These are smaller rivers or streams that join together to form a larger one.

9. Distributaries: These are channels formed by the division of a river as it flows into the sea. They are usually found in the delta region of a river.

10. River energy: This refers to the velocity or speed of a river. The efficiency of a river to erode and transport the .eroded materials depends very much on its velocity.

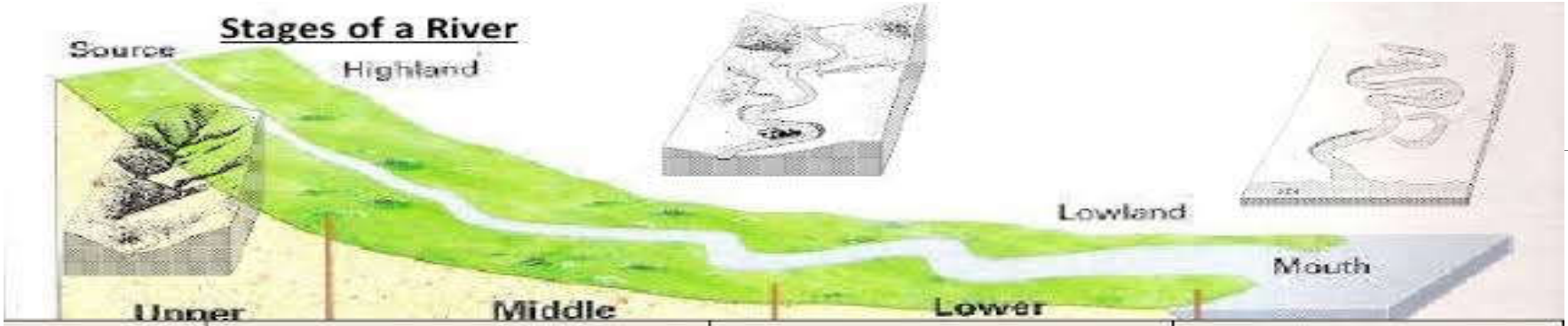
Rivers and valleys

- River features and land uses vary along the course of a river. Conflicts can arise between the different land uses and solutions must be adopted to minimise these disputes.

River stages

- A river is often divided into three parts or stages and has features that are specific to each stage.

The table below explains the main features of each stage.



	Upper Stage	Middle Stage	Lower Stage
Erosion	Active vertical mostly	Active vertical and horizontal erosion	Some horizontal but not much erosion
Gradient	Steep, steep valley sides	Becoming flat	Flat
Deposition	Some boulders too heavy to be transported in small stream	Deposition inside meander bends	Lots of deposition especially near mouth where river slows
Depth	Deep	Deep in places	Shallow (because of deposition)
Velocity	Fast	Medium	Slow
Width	Narrow	Wide in parts	Very wide
Volume	Very low	Medium	Large
Landforms	Waterfalls, V-shaped valley, gorges, interlocking spurs	Small meanders, oxbow lakes, small floodplains	Floodplains, mouth, delta, estuary, large meanders, oxbows

(I) Upper Course of a River

River features

V-shaped valleys

This is formed as a result of vertical corrosion or erosion of the river. The River valley is deepened and narrowed into a steep-sided V-shaped valley.

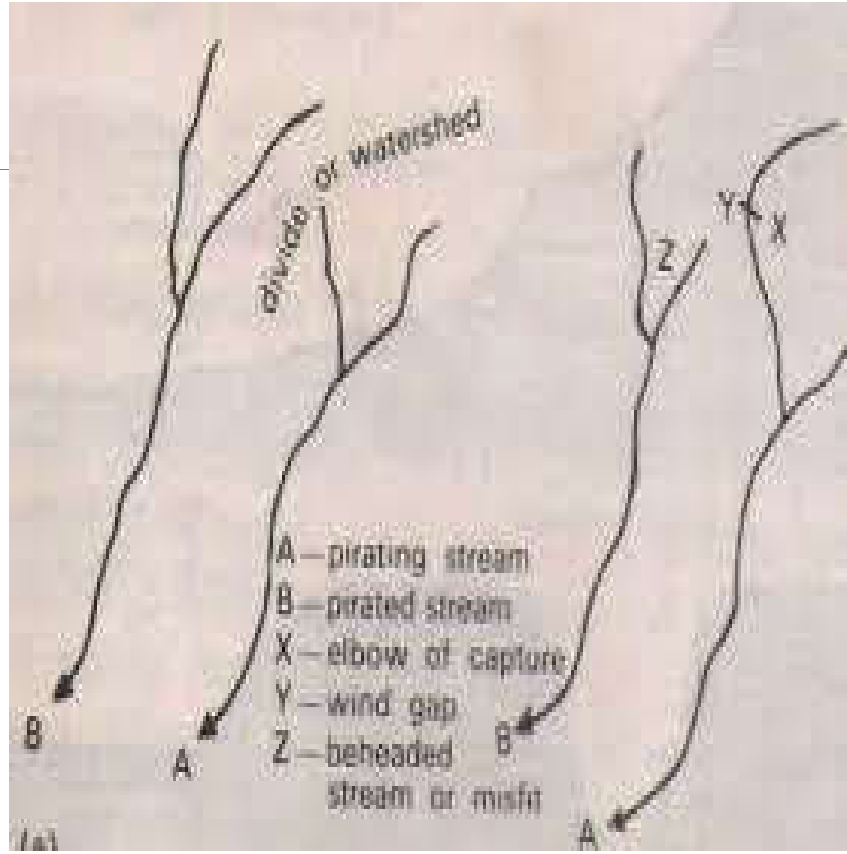
- **River features**

Gorge

- This is also formed due to the deepening and narrowing of the river as a result of vertical erosion .As a result, the valley is deep and narrow with vertical sides , resulting in the formation of a gorge.

River features

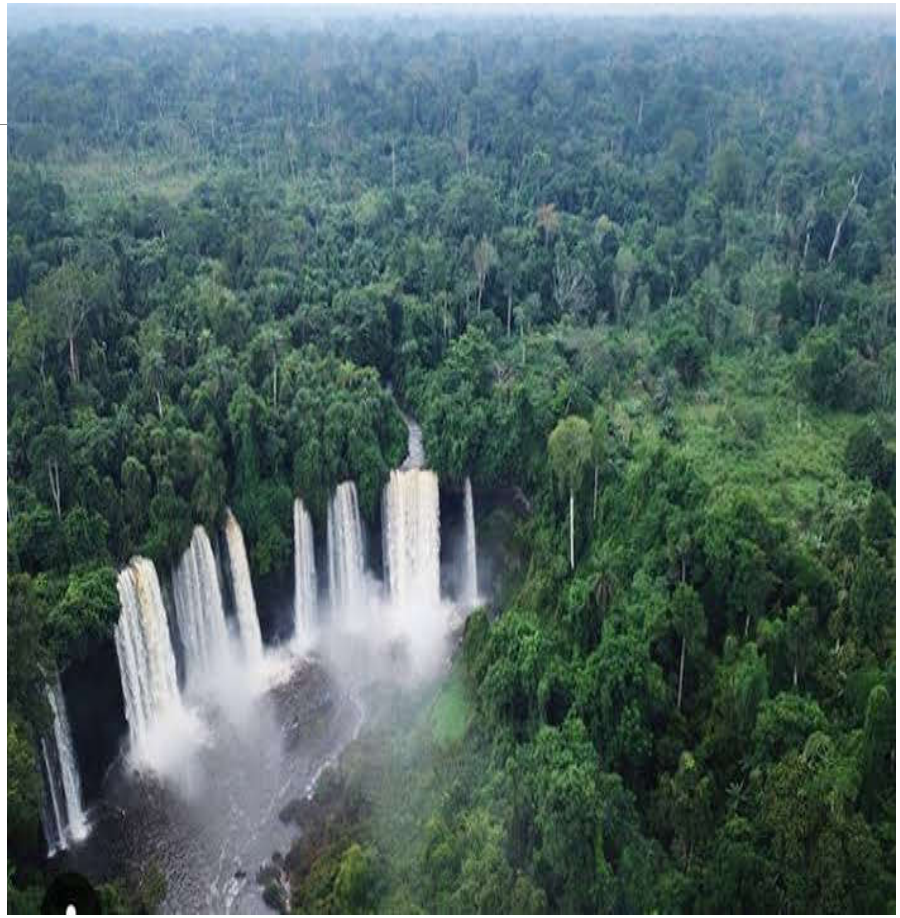
- River capture
- A river capture refers to two parallel consequent rivers with tributaries separated by a more powerful river and with presence of wind gap.
- River capture is formed when a river through headward erosion flows into a water divide and cuts off the headwater of another weaker river.



River features

- Rapids and Cataracts
- These features are formed due to uneven resistance of hard and soft rocks which are crossed by a river. The outcrop of the hard Rock might cause a river to jump upstream.

Waterfall



River processes

Erosion - the wearing away of the land and the stones carried in the river.

Transport - the movement of rocks, sand, and silt by the river.

Deposition - the dumping of rocks, sand and silt wherever the river slows down.

Erosion

The main ways in which a river erodes are:

Corrasion - wearing away of the **river bed** and banks by the **load** hitting against them.

Attrition - wearing down of the load as the rocks and pebbles hit the river bed and each other, breaking into smaller and more rounded pieces.

Hydraulic action - breaking away of the river bed and banks by the sheer force of the water getting into small cracks.

Chemical action (**corrosion**) - water dissolves minerals from the rocks and washes them away.

Middle Course Of a River

Rivers features:

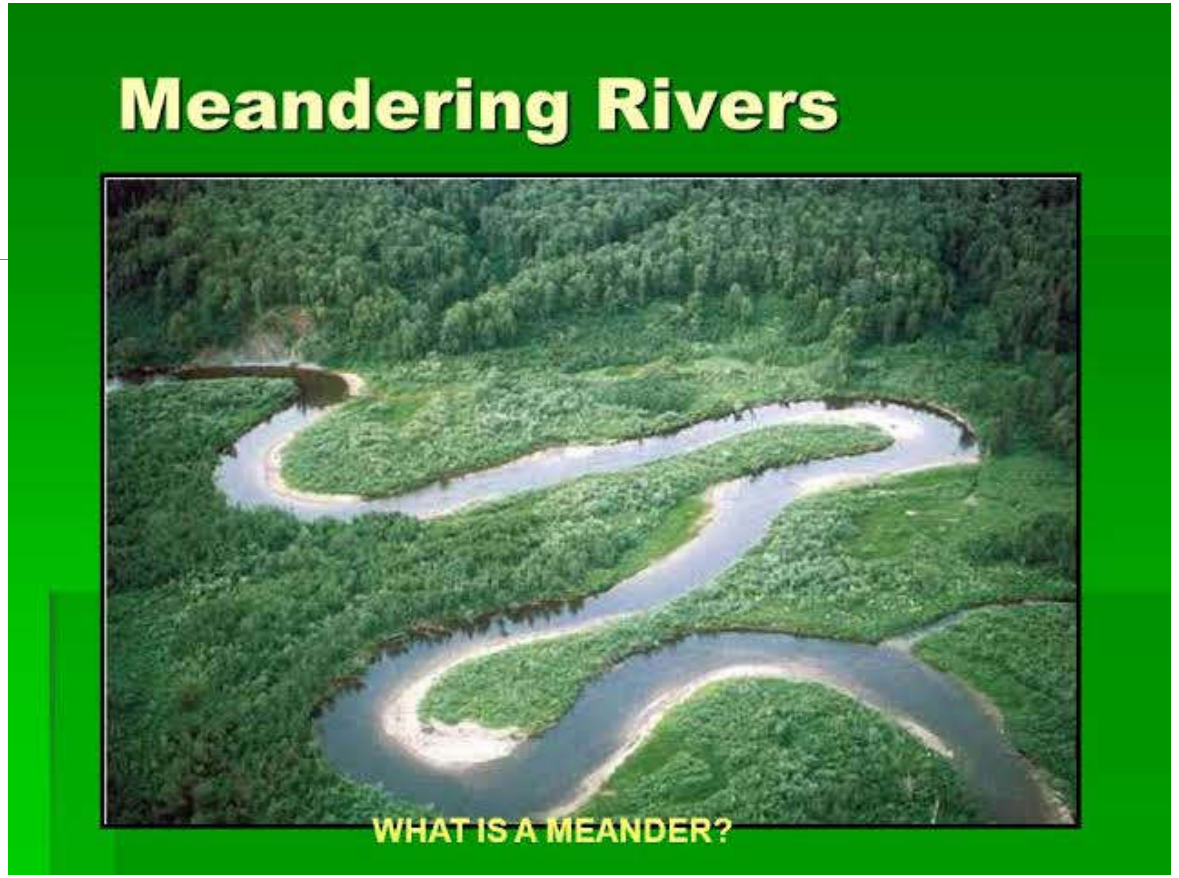
Wide V-shaped valley

As a result of lateral corrosion which has become more dominant than vertical corrosion, the river banks widen to produce a wide V-shaped valley. The valley sides are less steep.

River feature:

Meander

This results when rivers are unable to flow straight because of low gravity, sluggish movement of water and heavy loads. Also, the irregularities of the ground force the river to swing in loops, thereby, forming meanders.



River cliff and slip-off

River Cliff

- Constant erosion (undercutting) erodes the outer (concave) bank of the meander
- forming a river cliff.

Interlocking spur

This refers to the portion of the valley wall which projects from both sides of the concave bends of the river as it meanders.

Processes of River Transportation

The main ways in which transport happens are:

Traction - quite large stones can be rolled or dragged along the river bed by the force of the water.

Saltation - small stones which the water cannot lift, bounce off each other and are carried forward for short distances by the water above the river bed.

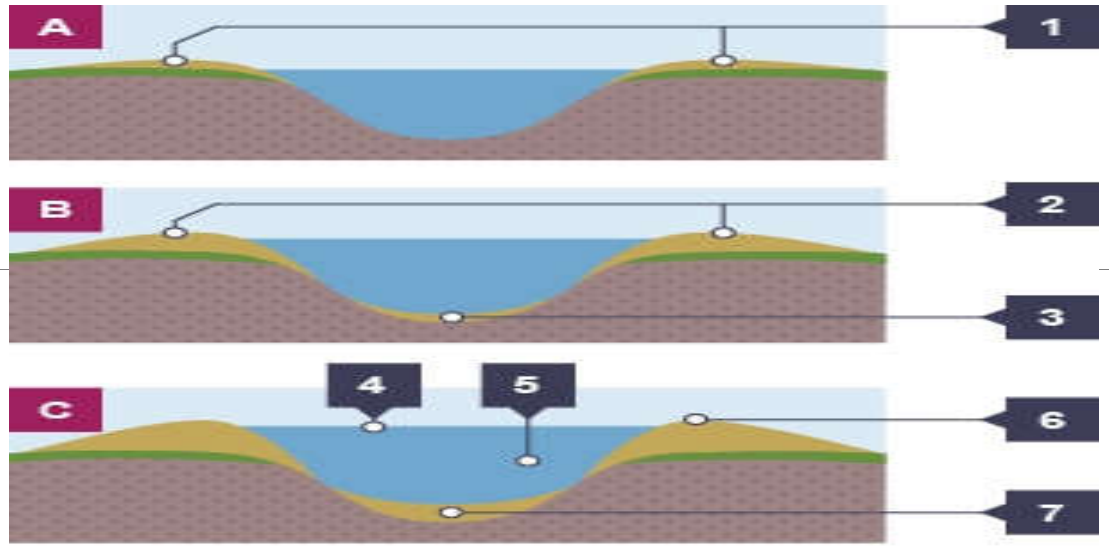
Suspension - if particles are small enough the river can lift them and carry them long distances.

Solution - when the river dissolves minerals from the rocks they are carried in the water itself.

Lower course of a River

Flood plains

Levees

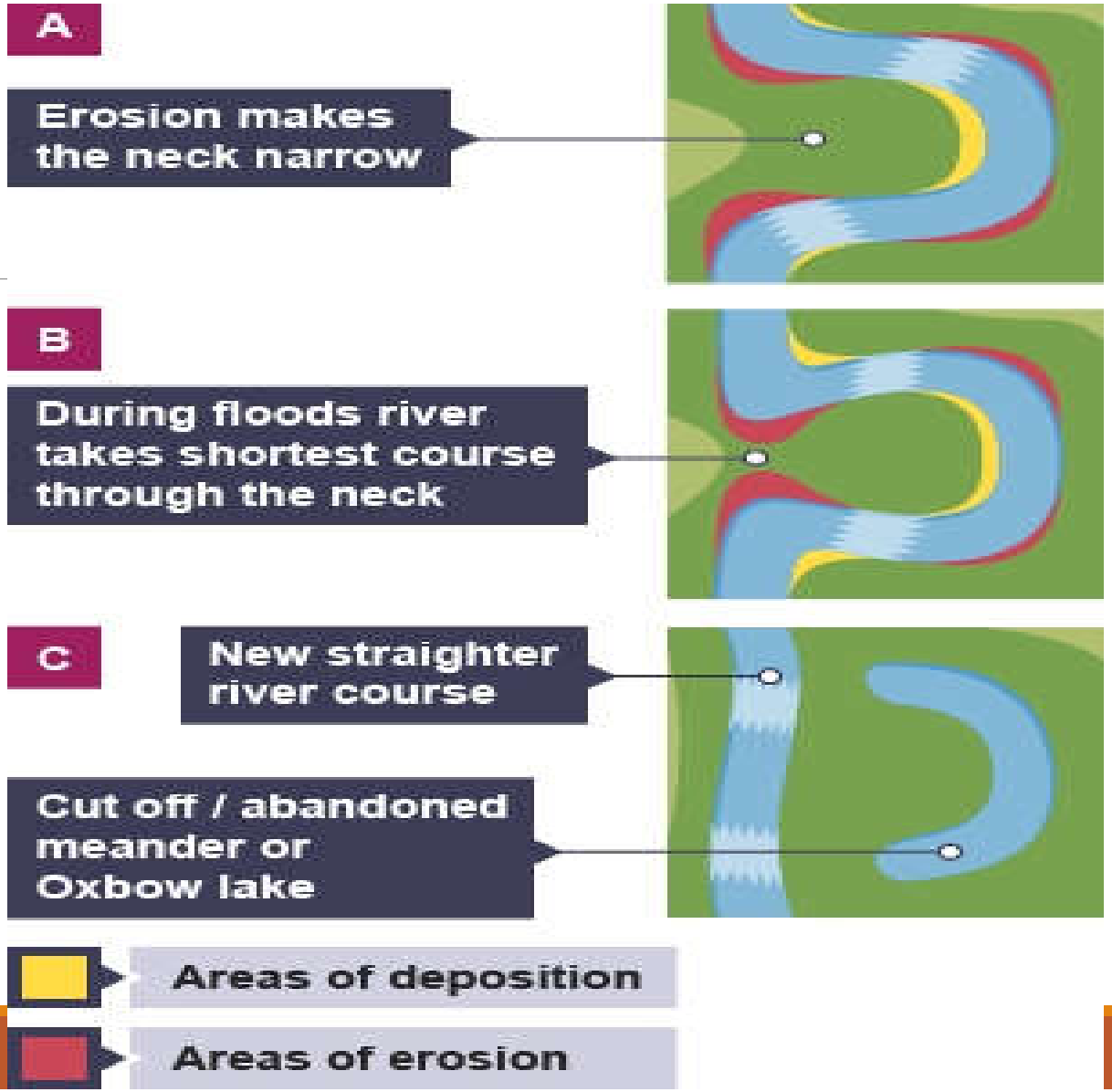


1. During a flood, water flows over the banks and deposits silts
2. New levees
3. In between floods slow moving river deposits silt in riverbed
4. New river level
5. With each flood the levees are built up
6. Between the floods the river bed is built up too
7. River may flow well above the level of the flood plain

Formation of a levée

The river is on its floodplain with a very low **gradient**.
The river is mainly depositing (silt and sand).
When the river floods a lot of silt is deposited on the river banks and much less on the floodplain.
Frequent flooding continues this build up.
When the river is flowing normally it deposits in the river bed.
This raises the river above the floodplain.
Usually the built-up levées protect the plain from flooding

Ox-bow lake


A
Erosion makes the neck narrow
B
During floods river takes shortest course through the neck
C
New straighter river course
Cut off / abandoned meander or Oxbow lake
Areas of deposition
Areas of erosion

Formation of an oxbow lake

- The river is **meandering** across the valley.
- The river is eroding laterally (from side to side).
- The river flows faster on the outside bends and erodes them.
- The river flows slowly on the inside bends and deposits material so its course is changing.
- Continual erosion and deposition narrows the neck of the meander.
- Often during a flood the river will cut through the neck.
- The river continues on its straighter path and the meander is abandoned.
- New deposition seals off the ends and the cut-off becomes an oxbow lake that will eventually dry up.

Braided strear

Delta

Importance of Delta to Man:

(I)Delta provides a good agricultural land especially for cultivation of rice, oil-palm, raffia palm, e.g River Niger.
(ii)It is also good for fishing.
(iii)It is equally good for petroleum mining.
(iv)It is good for development of ports.