

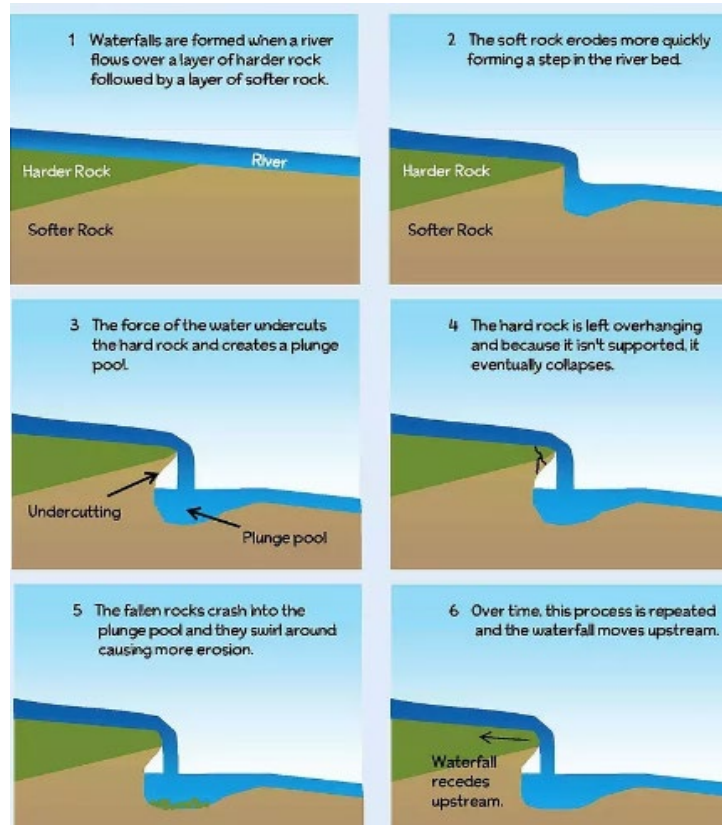
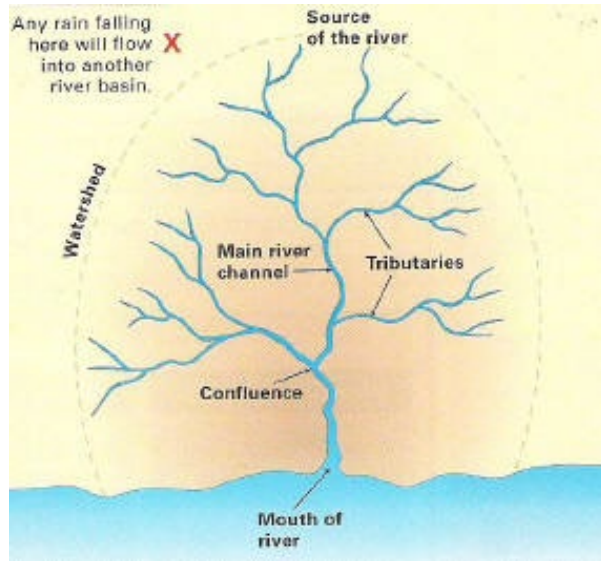
Enquiry question for this unit. How do rivers change from source to sea?

How do rivers affect people?

What are rivers like around the world?

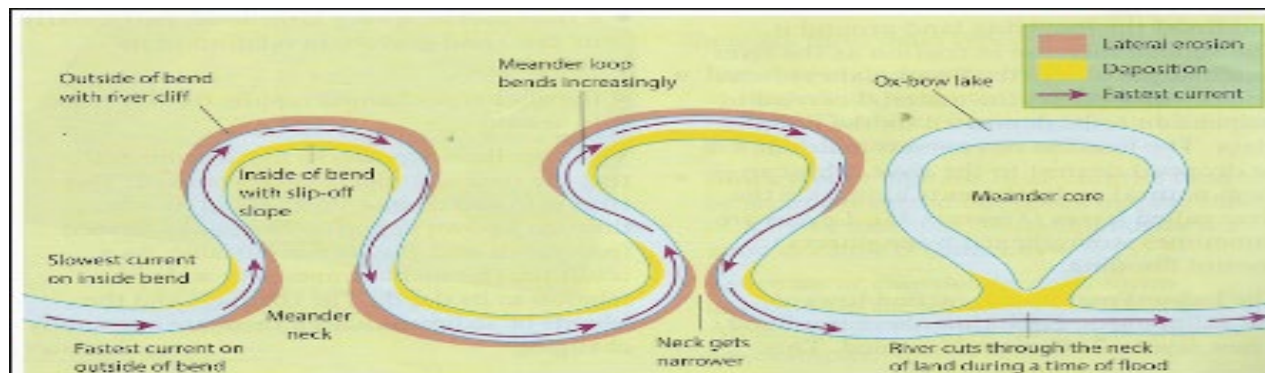
Key Words	Definitions
River	Continually flowing fresh water drained from the land.
Drainage basin	An area of land drained by a river.
Source	The start of a river
Tributary	A small river that joins the main river channel.
Confluence	Where two rivers meet.
Channel	The part of a river where the water flows.
Mouth	Where the river meets the sea.
Erosion	The process where rocks are broken down by natural forces such as wind or water.
Hydraulic action	The pressure of the water erodes the river bank.
Abrasion	The sediment carried by the river is thrown at the banks and beds and erodes them.
Solution	Chemicals in the water cause the river banks and bed to erode.
Attrition	Rocks hit each other and break apart.
Traction	Large rocks are rolled along the river bed.
Saltation	Rocks "hop" along the river bed.
Suspension	Sediment is carried in the water.
Solution	Sediment is dissolved in the water and moved downstream.
Course of a river	A river can be separated into the upper course, near the source, the middle course and the lower course near the mouth.
Waterfall	Water falling from a higher to a lower point due the different erosion rates of the rock over which it is flowing.
Gorge	A steep sided landform created by the retreat of a waterfall.
Meander	A bend in the river.
Ox-bow lake	A lake formed when a meander loop is cut off from the main channel due to erosion.
Deposition	The dropping of sediment. This happens when a river doesn't have enough energy to carry the sediment further.
Flooding	When there is too much water in the channel and it spills onto the surrounding land.

A drainage basin



Waterfall formation

For a waterfall to form there must be hard rock over soft rock. The river erodes the rock through hydraulic action and abrasion but the soft rock is weaker so erodes more quickly than the hard rock. This causes the formation of a plunge pool at the base of the waterfall and the undercutting of the hard rock, leaving it unsupported. Over time the hard rock will collapse as it has no support. The waterfall retreats upstream leaving a steep sided gorge. The process then starts again.



Ox-bow lake formation

Ox-bow lakes form from a meander. Erosion, in the form of hydraulic action and abrasion occurs on the outside bend of the meander. Over time this reduces the size of the meander neck. Deposition occurs on the inside bend. The meander neck continues to get smaller and smaller until, during a flood, the river breaks through the neck of the meander, takes the shortest route and bypasses the meander loop. Over time deposition occurs and the meander loop is totally cut off from the river channel. This is an ox-bow lake.

Causes of river flooding

Physical causes of flooding:

- heavy rainfall
- long periods of rain
- snowmelt
- steep slopes
- impermeable rock (doesn't allow water through)
- very wet, saturated soils
- compacted or dry soil

Human factors increasing flood risk:

- urbanisation, because towns and cities have more impermeable surfaces
- deforestation, because removing trees reduces the amount of water intercepted and increases run-off



Boscastle is a small coastal settlement in north Cornwall in the south west of England. It flooded on 16th August 2004.

Causes of flooding in Boscastle

- Heavy localised rainfall - 89 mm of rain fell in an hour.
- Saturated ground from previous rainfall.
- Topography of the land. The landscape upstream of Boscastle, a steep-sided valley, acted as a funnel directing vast volumes of water into the village.
- Narrow river channels in the village itself.

Effects of flooding in Boscastle

- People were left without homes and their possessions were ruined.
- Businesses had to close due to the flood water and the damage it caused.
- Trees were uprooted and carried downstream by the flood water.
- No one died



What has Boscastle done to prevent flooding in the future?

- A new flood defence scheme has been introduced.
- The scheme stretches along the valley, incorporating drainage, sewerage systems and land re-grading.
- Boscastle car park has been raised in height, which will stop the river from bursting its banks so easily.
- New drains allow water to run into the lower section of the river quickly.
- The river channel has been made deeper and wider so that it can accommodate more water.