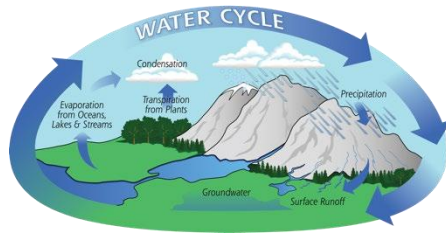


Year 9 - Rivers Knowledge Organiser

Water cycle

- The water cycle is powered by changes in temperature from the sun, and fuels our entire planet
- The water cycle is made up of three main processes – evaporation, condensation, and precipitation
- **Evaporation** happens when the heat from the sun warms surface water – in the form of lakes, rivers, oceans, and runoff from rain – and turns it into water vapour
- **Transpiration** is when water inside plants is turned into water vapour through the same process
- **Condensation** is when the water vapour begins to cool as it rises. As this happens, tiny water droplets come together to form clouds - **Precipitation** is the rain, snow, sleet, or hail that falls when these water droplets cool enough to turn back into a liquid or a solid
- Water then returns to the ocean as **throughflow** (water that has absorbed into and moves through the soil), **groundwater flow** (water that has soaked below the soil and deep into the earth), or **surface runoff** (water that runs over the top of soil and rocks).



River features

Source – the place where a river begins, usually a marsh or bog

Marsh – an area that floods frequently, where the land is usually wet

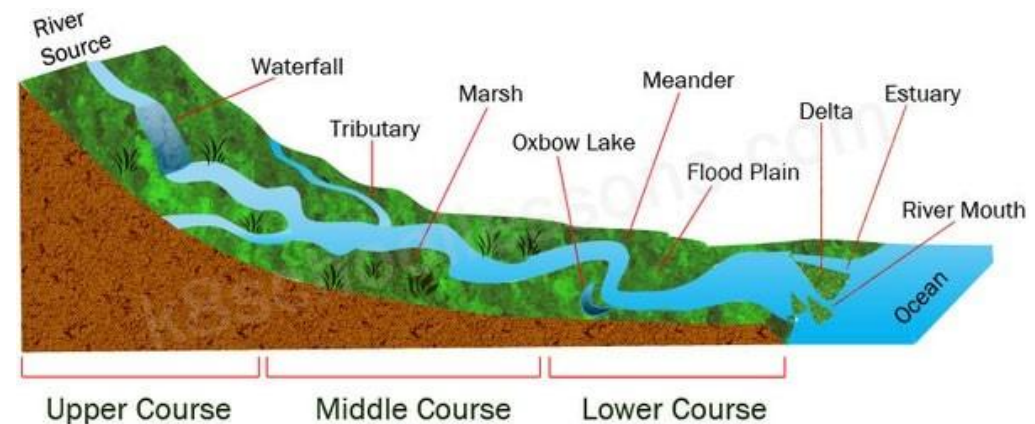
Tributary – small rivers that join a larger river

Confluence – the point at which two rivers meet

Floodplain – the land where a river floods

Mouth – the point where a river meets the sea

Estuary – a point at the mouth of a river where it meets the tide from the ocean/ sea and the freshwater and saltwater mix



River processes

Erosion

- **Hydraulic action** – as water rushes by, it forces air into cracks in the rock, which continue to widen and break -
- **Abrasion** – sand and rock are thrown against the riverbed and banks, wearing them away like sandpaper -
- **Attrition** – pieces of rock are thrown against each other, causing sharp edges to break off and eventually becoming smaller and rounder
- **Corrosion** – weak acids in the water break down the rock in the riverbed and banks

Transportation

- **Traction** – large stones are rolled along the riverbed
- **Saltation** – smaller stones bounce along the riverbed over one another
- **Suspension** – small particles of rock, dirt, and plants float in the water of a river, making it look cloudy
- **Solution** – particles of rock and chemicals are dissolved and carried along in the water unseen

Deposition

- Rivers **deposit** (drop) eroded material as they lose speed when:
- the river becomes shallower
 - the amount of water is reduced - the amount of material being carried increases
 - the river reaches its mouth
- They do this because they no longer have the **energy** to carry it.

Rivers Knowledge Organiser

River landforms

Upper course

V-shaped valleys – steep valleys that are formed as the river erodes the land it passes over; they are v-shaped because the land

Waterfalls – steep drops formed by uneven rates of erosion as rivers pass over differing bands of hard and soft rock

Middle course

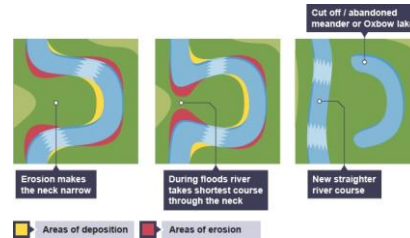
Meanders – bends in the river that are made more extreme as water flows more forcefully around the outside bend, eroding the riverbank further there and leading to deposition around the inside bend

Ox-bow lakes – when a meander bends so much that the river takes a short cut and leaves part of the meander cut off from the rest of the river

Levees – steep banks built up along a river intentionally or as a result of material being deposited on the banks during flooding

Lower course

Deltas – material that is deposited and builds up at the mouth of a river



Factors affecting flooding

Natural

Heavy rain – when it rains very heavily the water doesn't have time to soak into the soil, so it runs over the ground, causing flooding

Saturated soil – when soil is already holding a lot of water, it can't absorb any more

Tributaries – the more a river has, the higher the risk of flooding due to all the extra water

Steep slopes – water flows faster down steep slopes, meaning it doesn't have time to soak into the soil

Impermeable rock – some areas have **impermeable** rock (water cannot pass through) just below the soil, so water can't soak down

Human

Deforestation – leaves can catch rainwater (called **interception**) and tree roots take up a lot of water from soil; when there aren't any trees in an area this cannot happen

Built-up areas – rain can't soak through concrete, so it is carried away by drains and quickly returns to the river; if drains are blocked street can flood quickly even if they are not near a river

River management

Rivers are constantly changing. For humans to live near and utilize rivers they must be managed. Ways of managing rivers can use **hard engineering** (using man-made structures) or **soft engineering** (using parts of the environment in a more natural approach).

Hard engineering

- Dams
- River barriers
- Levees/ embankments
- Overflow channels

Soft engineering

- Afforestation (planting trees)
- Dredging
- Managed flooding

