ver management schemes be used to balance the human and physical environments?

Knowledge Organiser Year 8 Geography – Autumn 2

What metacognitive strategy will you use to make sure this knowledge sticks? https://www.bmsweb.co.uk/learning-and-teaching/knowledge-organisers/

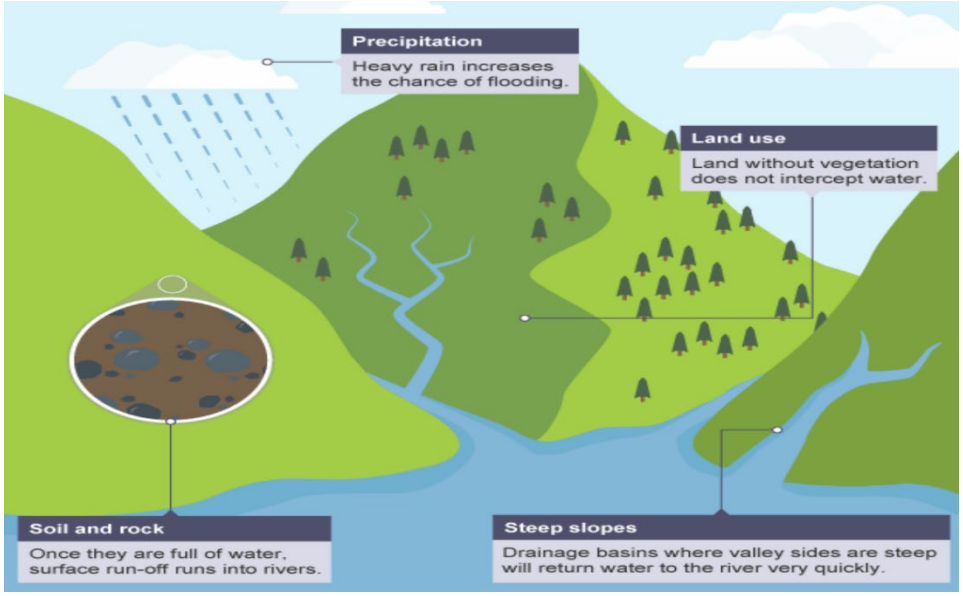
Key Terms

interception = precipitation that does not reach the soil	Dredging = using machinery to excavate sediment from a river bed in order to improve and re-shape the river	Deforestation / logging / losing many trees	Afforestation = a process where new forests are planted across land
bankfull discharge = water just fills a channel without overtopping the banks	Artificial / unnatural / fake	Sustainable / environmental / on going	Restoration / repair / restore to how it was before

A flood occurs whenever a river overflows its banks. A flood becomes a problem when the water rises to a level where it threatens property and life. Rivers usually flood due to a range of factors. These can be physical factors or human. Human interaction can make matters worse, however, adding natural features has wider impact than just the immediate area affected. Knowledge of management methods and their impact are used to make informed decisions when preserving and developing rivers.

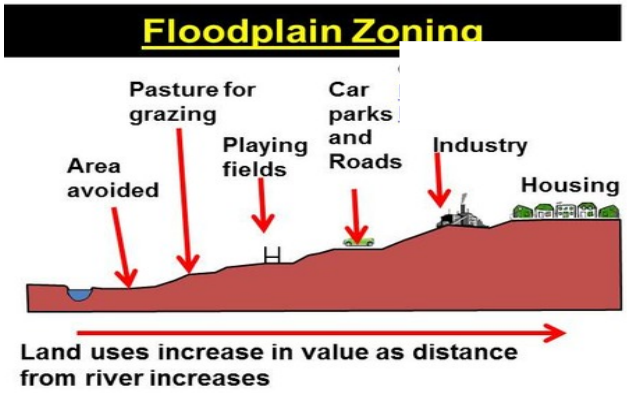
Human Causes

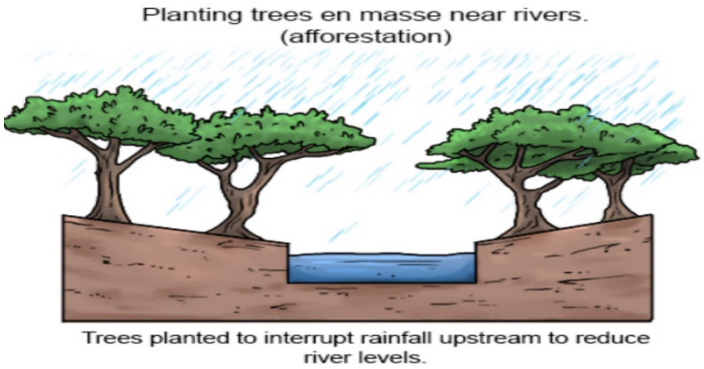
Physical Causes

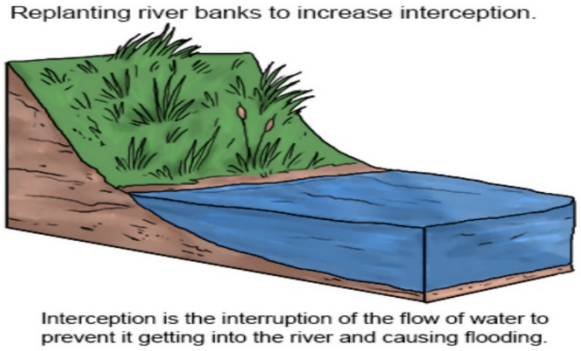


Flood prevention strategies - soft engineering

Soft engineering does not involve building artificial structures but takes a more **sustainable and natural** approach to managing the potential for river flooding. It includes flood warnings and preparations, flood plain zoning, river restoration, planting trees.







1. **Flood Warnings and Preparations**

The Environment Agency alert the public with apps, radio and TV.

Pros – reduce the impact of flooding by giving people time to prepare (e.g. evacuate, protect their homes/belongings).

Cons – the flood will still occur. Some people might not be alerted.

2. **Flood Plain Zoning**

Building is restricted in parts of the flood plain to reduce the impact of a flood. Hard surfaces would increase the likelihood of a flood.

Pros – impact of flooding is reduced. Floodplain retains its natural function.

Cons – restricts development/economic growth of an area. Offers limited help to areas already built on.

3. **Planting Trees**

Trees will intercept rainwater, increasing the lag-time and reducing discharge.

Pros – cheap. Soil erosion is reduced. Increased wildlife due to habitat creation.

Cons – less farmland is available.

4. **River Restoration**

Making the river more natural and allowing natural river processes to happen.

Pros – reduces flood risk downstream. Increases wildlife through habitat creation.

Cons – increases local flood risk.

Flood prevention strategies - hard engineering

Flooding can cause damage to homes, businesses, infrastructure and communications. Hard engineering involves building **artificial structures** which try to control rivers. They tend to be **expensive** such as the examples below.




1. Dams and Reservoirs

Reservoirs (artificial lakes) are formed behind a dam (a wall across a river) usually in the upper course.

Pros – reservoirs store water and provide a reliable water source. HEP can be generated. Flood risk is reduced.

Cons – very expensive to build. Flood settlements/habitats. Alters the river course downstream as land no longer floods, resulting in less fertile land as silt is no longer deposited. Eroded material is trapped behind the dam, which alters river processes and landforms downstream.

2. Straightening

Rivers are artificially straightened.

Pros – flood risk is reduced as water is transported away from the area quickly.

Cons – water is carried downstream quicker. As a result, flooding and erosion is more likely downstream.

3. Embankments

Raised walls along the river banks.

Pros – flooding will be less frequent as the river channel can hold more water.

Cons – if the river floods severely, flood waters will be trapped on the floodplain. Can be expensive.

4. Flood Relief Channels

Water is diverted from areas that are being protected.

Pros – water can be controlled by opening and closing flood gates.

Cons – expensive. Water is carried downstream quicker. As a result, flooding and erosion is more likely downstream.

Preare for a class quiz w/c 06.12.21

Example Question	Model Answer
Hard engineering means...	To use artificial structures to defend against natural processes
What is a dam?	A concrete barrier built across a river channel
Channel straightening also involves...	Dredging
What do embankments do?	Like levees, they increase the channel depth of a river, raising its bankfull discharge and reducing the risk of flood
Soft engineering is...	Designed to reduce the effects of flooding by working with natural processes and our knowledge of river systems
In comparison to hard engineering, soft engineering is...	Cheaper, easier to maintain and better for the environment.
How could planting trees positively impact flood management?	Increases interception and soaking up water from the ground
A disadvantage of planting more trees to help reduce the effect of flooding is that...	They take a long time to grow, delaying the benefit
River restoration means...	Changing a river channel back to its natural state, having been managed by hard engineering in the past.
Which type of engineering is more sustainable and cheaper?	Soft engineering
What does velocity mean?	Speed of the river's water flow
What does precipitation include and how does it impact flooding?	Rain, snow, hail, sleet. Heavy or long periods of precipitation will cause flooding if there is too much water to infiltrate into the ground causing increased surface run off.