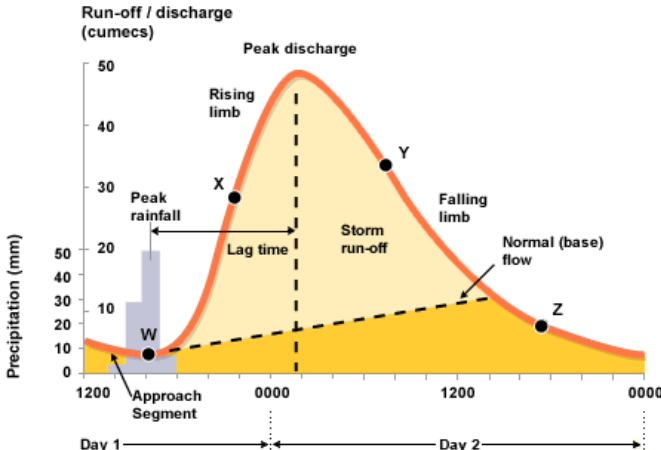


Rivers 100% sheet 2

4. An example of a river valley in the UK to identify its major landforms of erosion and deposition.	River Severn Source = Plynlimon Hills, 610m above sea level Mouth = Bristol Channel Interlocking spurs = Llanidloes Waterfalls = Water breaks its neck, 6km from the source, area of sandstone (Hard rock) and mudstone (soft rock). Meanders = Shrewsbury, a large, tight meander runs through the town Floodplain = Tewkesbury. Estuary = the Severn estuary, 5km wide, 20 m deep Long profile: very steep in the upper course, gentle gradient in the lower course
5. How physical and human factors affect the flood risk – precipitation, geology, relief and land use.	Human factors (land use): <u>Urbanisation</u> – impermeable surfaces → no infiltration → more surface runoff AND drains → water goes directly to the river → ↑ flood risk <u>Deforestation</u> – less interception and transpiration → increased runoff to river → ↑ flood risk Physical factors: <u>Heavy rainfall</u> – rain falls faster than it can infiltrate into the soil → more surface runoff → ↑ flood risk <u>Prolonged rain</u> - Ground is saturated → no more infiltration → more runoff → increased flood risk <u>Relief</u> – steep relief → rapid surface runoff → ↑ flood risk <u>Rock type (geology)</u> – permeability of rock affects percolation → affects volume of water entering the river. Impermeable = no percolation → more surface runoff → ↑ flood risk
6. The use of hydrographs to show the relationship between precipitation and discharge.	Hydrograph A graph which shows the discharge of a river, related to rainfall, over a period of time. Lag time: the time between peak discharge and peak precipitation. It shows how long it takes for precipitation to reach the river. A short lag time means... there has been lots of fast surface runoff into the river instead of slow infiltration and percolation. Peak discharge: this is the highest discharge the river has during a storm event. A high peak discharge means ... most of the precipitation reached the river rather than being stored in the soil and rocks, or on plants' leaves. 
7. Different management strategies can be used to protect river landscapes from the effects of flooding	The costs and benefits of hard and soft engineering strategies: Hard engineering: Involves the building of entirely artificial structures using various materials such as rock, concrete and steel to reduce, disrupt or stop the impact of river processes. <u>Dams and reservoirs</u> ☺ holds back water to prevent floods, last a long time, generate HEP, water storage for industry/locals ☹ expensive, eyesore, floods the land behind the dam, damages habitats <u>Straightening</u> ☺ increases river velocity so reduces flooding in that area, not an eyesore ☹ can damage habitats, passes problem on downstream, cannot be done where buildings already surround the river <u>Embankment</u> ☺ increase the river's capacity so reducing flooding in that area ☹ passes problem downstream expensive, can be an eyesore, if they break floods can be catastrophic <u>Flood relief channels</u> ☺ reduces the height of the river in the main channel, can create new wetland habits ☹ may flood where the relief channel re-joins the main channel Soft engineering: Involves the use of the natural environment surrounding a river, using schemes that work with the river's natural processes. Soft engineering is usually much cheaper and offers a more sustainable option as it does not interfere directly with the river's flow.

<i>continued....</i>	<u>Flood warnings and preparation</u> 😊 costs are reduced as people can evacuate and move belongings ☹️ floods still happen so damage is still caused. <u>Floodplain zoning</u> 😊 reduces costs of floods, reduces flood water as infiltration can occur if there are fields around the river ☹️ not possible in areas which have already been built on <u>Planting trees</u> 😊 increases interception and transpiration so reduces river discharge, creates habitats ☹️ takes a long time to grow, takes up farm land <u>River restoration</u> 😊 creates new habitat, little maintenance needed, reduces flooding downstream ☹️ may create new wetland areas so taking up land, not possible if urban areas have built up along the river.						
<u>8. An example of a flood management scheme in the UK</u>	<u>Why the scheme was required</u> - Shrewsbury has extensive areas at risk from flooding. It lies mainly on slatey-shales, impermeable rock, there are a number of tributaries feeding into the river upstream of Shrewsbury. In autumn of 2000, the worst flooding for over 50 years caused widespread damage along the length of the River Severn. Roads and pavements were impassable, the Riverside and Pride Hill shopping centres were evacuated and closed, 400 properties were affected, £7-8 million cost. <u>The management strategy</u> <u>Hard engineering:</u> steel sheet pile underground walls up to 16 metres deep reinforced concrete flood walls up to 3 metres high demountable aluminium barriers - major improvements to the drainage system, including the construction of two new large pumping stations. <u>Soft engineering:</u> flood warning system <table border="1" data-bbox="284 1243 1497 1982"> <tr> <td data-bbox="284 1243 502 1512">Social issues</td><td data-bbox="502 1243 1497 1512"> Protects homes and keeps people safe 😊 Maintaining the pedestrian link between Frankwell and the town during times of flood, and improved standard of living and general well-being for residents and business owners. 😊 </td></tr> <tr> <td data-bbox="284 1512 502 1780">Economic issues</td><td data-bbox="502 1512 1497 1780"> Access to businesses is maintained throughout the year, and insurance premiums are reduced. 😊 It cost £3.5 million. ☹️ </td></tr> <tr> <td data-bbox="284 1780 502 1982">Environmental issues</td><td data-bbox="502 1780 1497 1982"> Some riverside trees cut down to allow for the creation of the defences. ☹️ Planting of trees and shrubs along the new flood defences has taken place. 😊 </td></tr> </table>	Social issues	Protects homes and keeps people safe 😊 Maintaining the pedestrian link between Frankwell and the town during times of flood, and improved standard of living and general well-being for residents and business owners. 😊	Economic issues	Access to businesses is maintained throughout the year, and insurance premiums are reduced. 😊 It cost £3.5 million. ☹️	Environmental issues	Some riverside trees cut down to allow for the creation of the defences. ☹️ Planting of trees and shrubs along the new flood defences has taken place. 😊
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