Unit 1 Theme A: The Dynamic Landscape - Rivers

1. The drainage basin - a component of the water cycle

Learning outcomes: by studying this section you should:
- demonstrate knowledge and understanding of the **components of the drainage basin cycle** and their interrelationships:
  - inputs: precipitation;
  - stores: interception by vegetation;
  - transfers: surface runoff/overland flow; infiltration; throughflow; percolation; groundwater flow;
  - outputs: river discharge;
- identify and define **characteristics of a drainage basin** (watershed; source; tributary; confluence and river mouth).

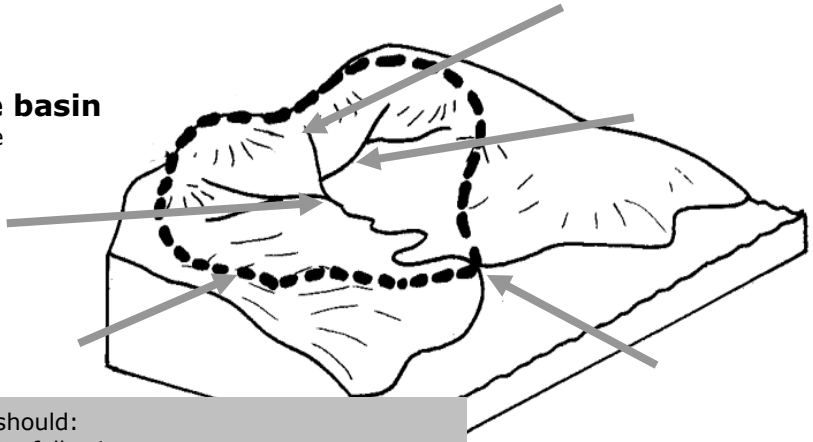
A. The drainage basin cycle

Define the following terms. Highlight the **inputs, stores, flows** and **outputs** in different colours

- precipitation
- interception
- infiltration
- through flow
- overland flow
- percolation
- groundwater flow
- channel outflow from river mouth

B. The characteristics of the drainage basin

Add annotation to identify the characteristics onto the following diagram



2. River processes & features

Learning outcomes: by studying this section you should:
- demonstrate knowledge and understanding of the following **processes**:
  - erosion (attrition; abrasion/corrasion; hydraulic action and solution/corrosion)
  - transportation (solution; suspension; saltation and traction)

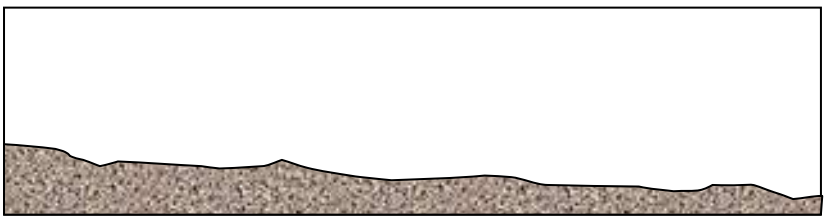
A. Erosion processes

Name & define the four processes of erosion:

-
-
-
-

B. Transporation processes

Use the following diagram to define the four processes of transportation



C. Deposition

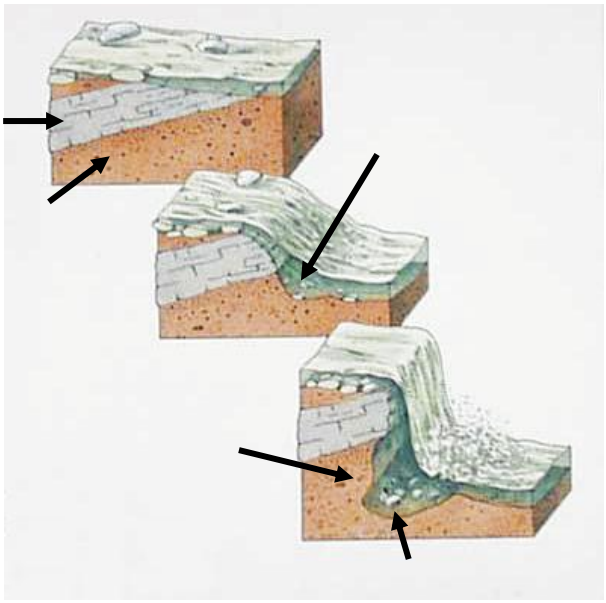
Deposition occurs when…

Learning outcomes: by studying this section you should:

- explain (with reference to places for illustration purposes only), the formation of the following river **landforms** using annotated cross-sectional diagrams of features: waterfall; meander; floodplain

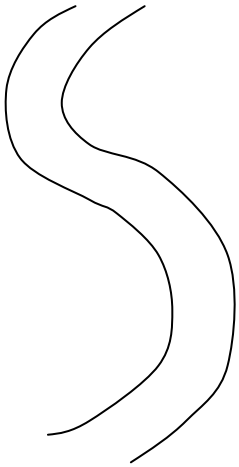
A. Waterfalls

Add annotation to the following diagram to summarise the formation of a waterfall.



B. Meanders

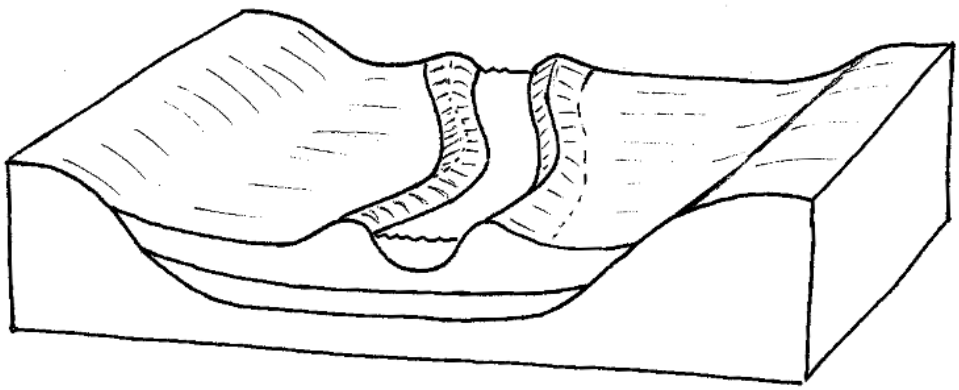
Add annotation to the following diagram to summarise the formation of a meander.



Add annotation to this diagram to show the cross section of a meander.

C. Flood plains

Add annotation to this diagram to show the features of a floodplain.



2.3. Downstream changes in river characteristics features

Learning outcomes: by studying this section you should understand how and why rivers change downstream in terms of their: (1) gradient, (2) depth, width, discharge and (3) river load

As you move downstream…

Description	Explanation
Gradient _____	
Depth and width _____	
Discharge _____	
River load gets _____ and more _____	

2. River processes & features

Learning outcomes. By the end of this section you should be able to:

- understand the **physical** and **human** **causes** of flooding
- recognise the **impacts** of flooding on **people** (loss of life, property & insurance cover) and the **environment** (pollution & wildlife)
- understand the **management strategies** used to reduce the impacts of flooding:
  - **hard engineering**: dams, levees/embankments, flood walls, straightening and deepening the river, storage areas
  - **soft engineering**: washlands, land-use zoning, afforestation
- know and understand two case studies of flooding and its management: River Derwent (2009) & Mississppi

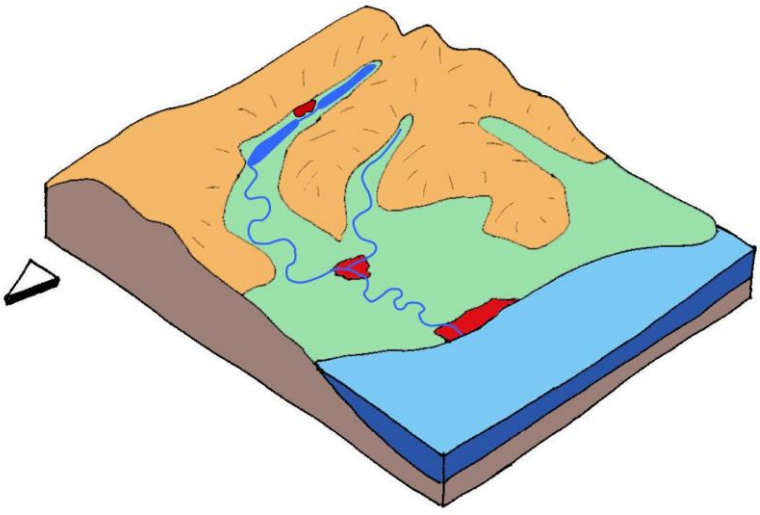
A. Introduction

- What is the difference between hard and soft engineering?
- Why is soft engineering sustainable (give a detailed answer for this)

case study **Flooding in the River Derwent**

A. Causes

Summarise the physical and human causes of flooding on this diagram.

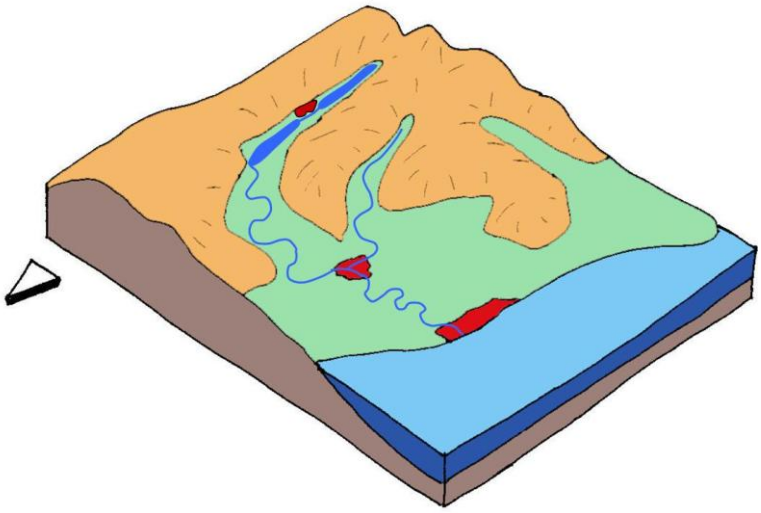


B. Impacts

Summarise the impacts in this table

Impacts on People	Impacts on Environment
Loss of life People needing rescued	Wildlife
Property damage & insurance loss (cover damage to homes & bridges)	Pollution

C. Management response
Summarise the management response on the following diagram.



case study **Sustainable management of flooding in the Mississippi**

Hard engineering		
Technique	**Effectiveness for controlling flooding**	**Negative consequence of technique**

Soft engineering		
Technique	**Effectiveness for controlling flooding**	**Other benefit**