

2.22 Rivers and drainage basins.



THEME 2. TOPIC 22

Learning objectives:

1. Rivers and the water cycle.
2. Drainage basin characteristics.

Key terms:

Precipitation-хур тунадас

Discharge- усны зарцуулга

Watershed- ус хагалбар

Condensation – конденсац, усны уурын өтгөрөл

Evapotranspiration- нийлмэл ууршилт

Evaporation - ууршилт

Interception – орсон борооны дусал мод навчинд хадгалагдах.

Overland flow – хажуугийн урсац

Drainage basin-голын ай сав, ус цуглуулах талбай.

tributary- цутгал гол

Confluence –нийлэх \үндсэн голд\

River basin - ай сав, ус хураах талбай

Drainage-голын сүлжээ

River source – голын эх

Watershed - ус хагалбарын шугам

Drainage divide \drainage basin\ - голын ус хагалбар

1. Rivers and the water cycle.

All rivers receive their water from precipitation-that is rain, hail, snow, and sleet. But the relationship between precipitation and the amount of water in a river, known as discharge, is not straightforward. Only a small amount of the water that falls reaches the river, which is just part of the water, or hydrological, cycle.

Once clouds have released the precipitation, many different routes and destinations are possible for water. It may:

- Evaporate back into the atmosphere
- Be transpired by plants
- Be kept by plants or in the soil
- Stay for a time in lakes, glaciers or reservoirs
- Infiltrate into the ground to become groundwater
- Run off the surface immediately into rivers

Through rivers, the water reaches the sea to be evaporated again and the water cycle continues.

Evaporation

The sun heats the water in oceans, rivers, puddles and even laundry hanging on clotheslines. The droplets evaporate and heat up into the air as water vapour.

Condensation

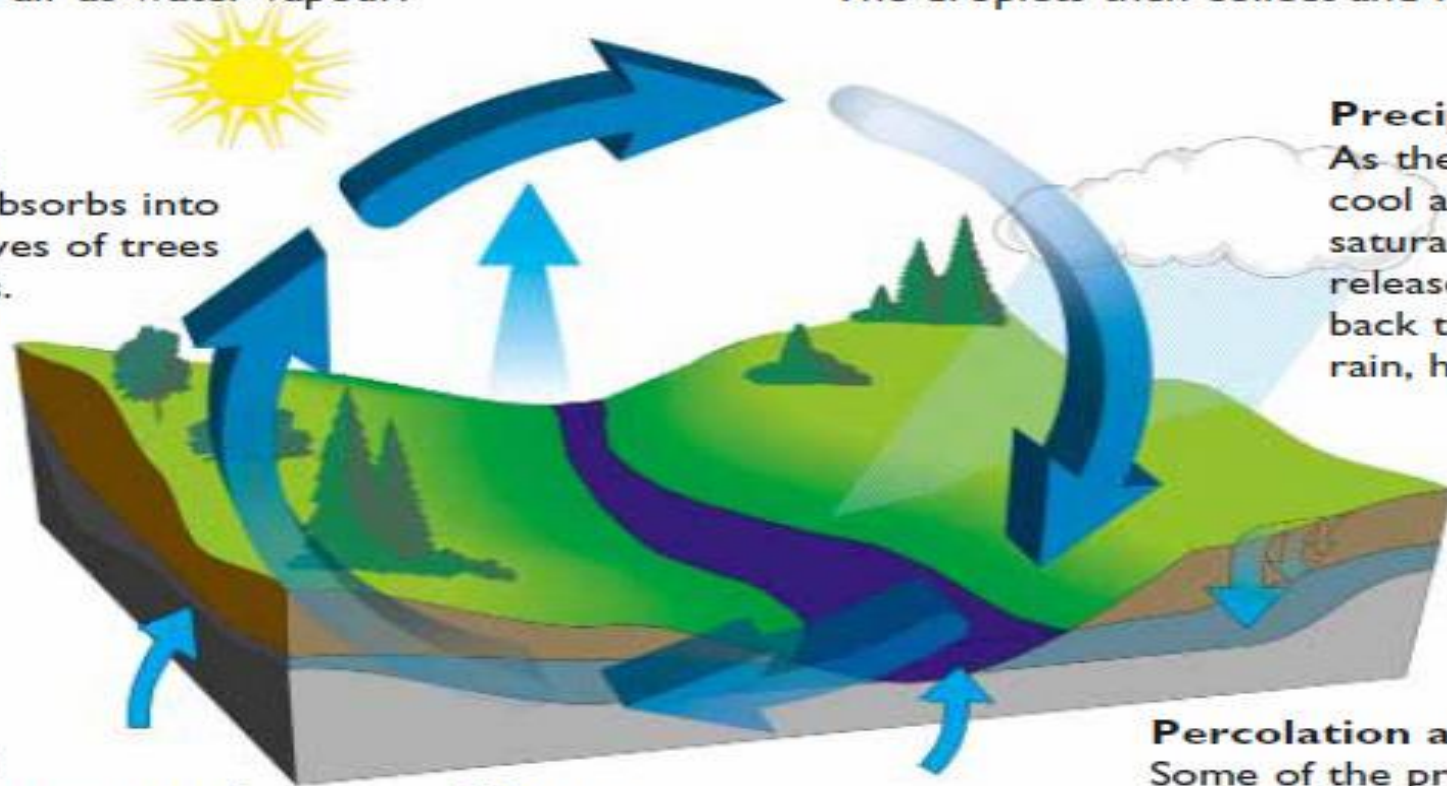
When the water vapour rises into the cooler air above the earth, it condenses or turns back into liquid water droplets. The droplets then collect and form clouds.

Transpiration

Water vapour absorbs into the air from leaves of trees and other plants.

Precipitation

As the clouds cool and become saturated, they release the water back to the earth as rain, hail or snow.



Groundwater

Some of the water returned to the earth soaks into the ground and replenishes underground reserves.

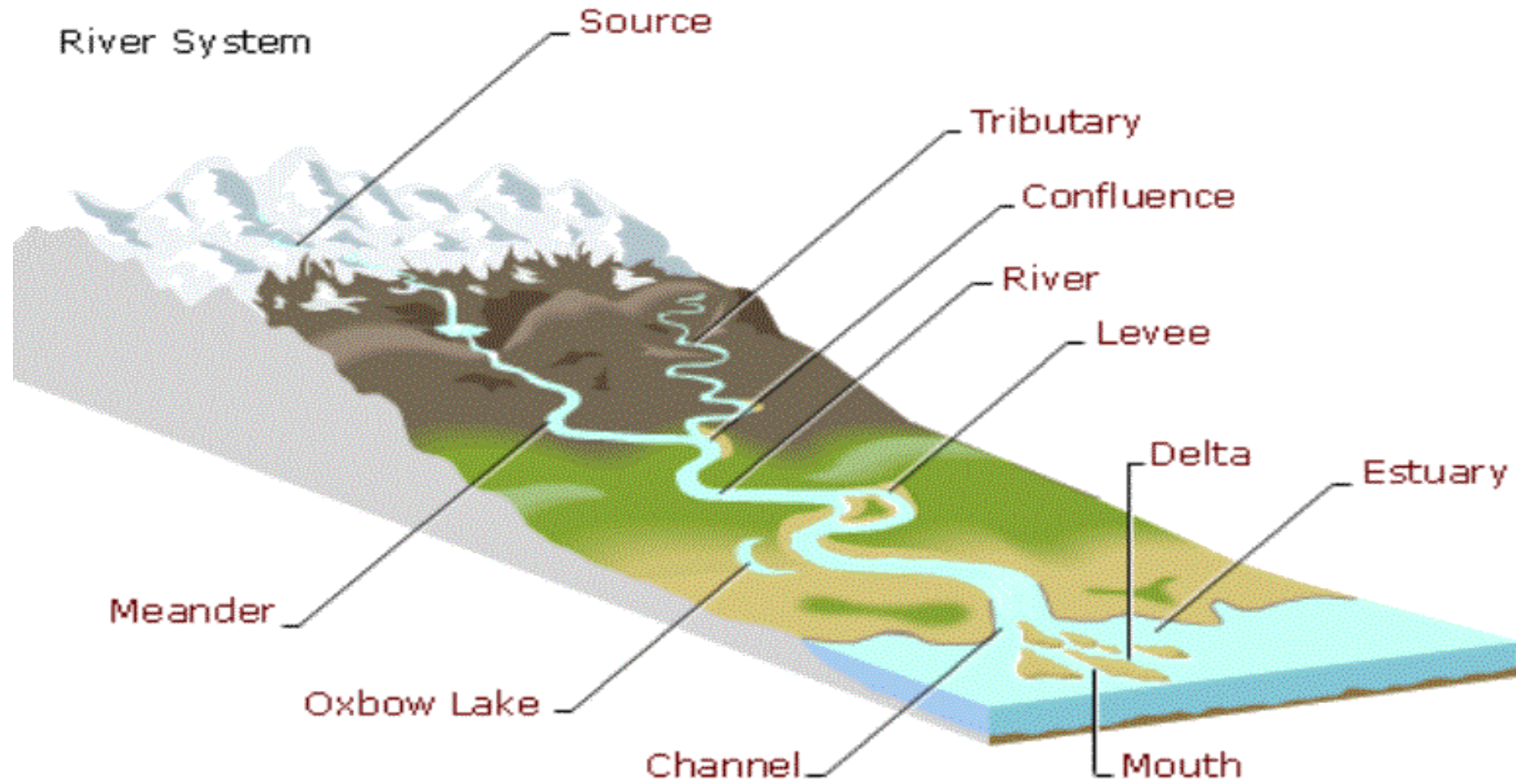
Storage

Some precipitation falls into lakes and streams, or is fed directly to these water bodies and water courses over land or via the water table.

Percolation and Runoff

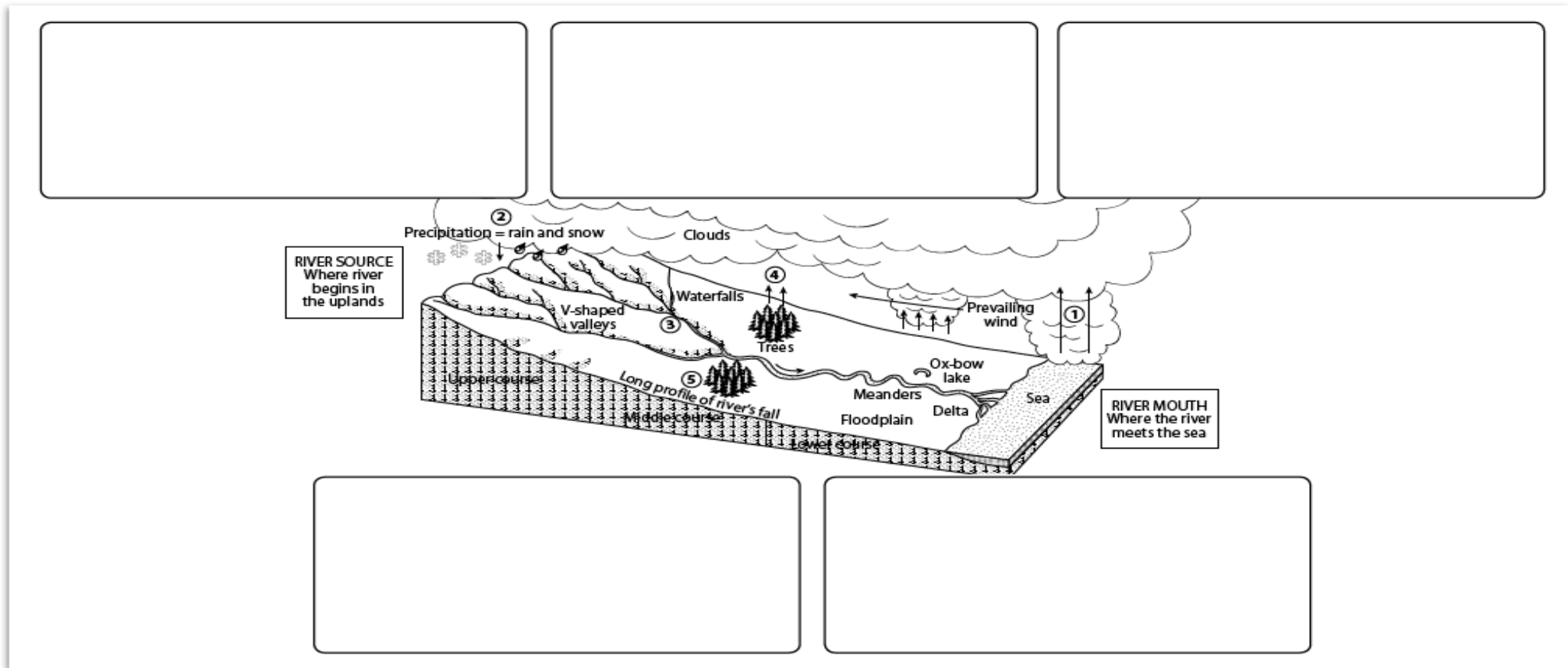
Some of the precipitation moves downwards, percolating through pores and cracks in soil and rock. The excess becomes overland runoff into creeks, rivers and lakes.

River system.



Task 1: On an outline copy of the diagram, match caption A-E with locations 1-5. (page 78)

The water (hydrological) cycle



2. Drainage basin characteristics.

Every river system is provided with water from a variety of sources.

These include tributary streams, surface runoff, and groundwater.

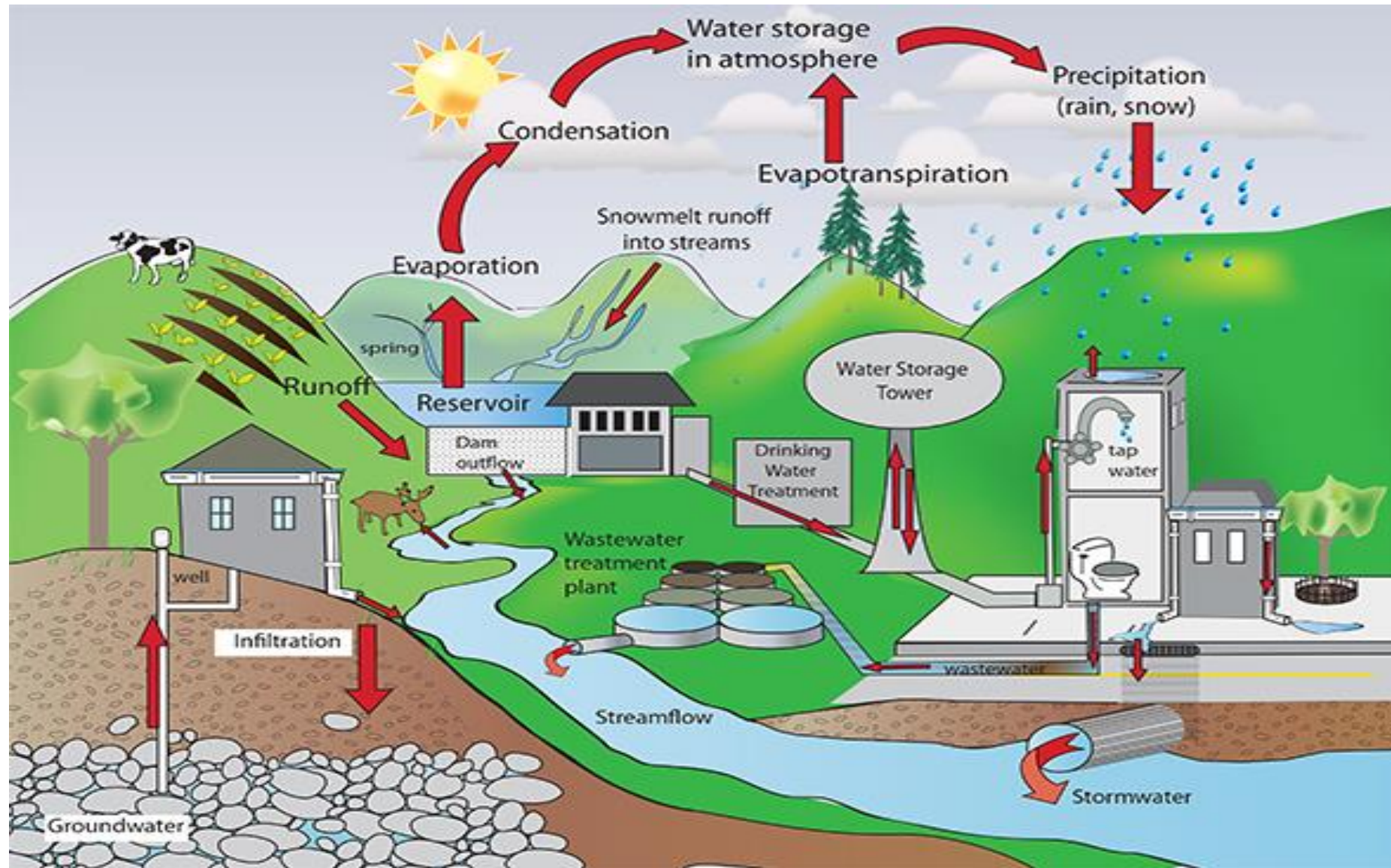
The surface area that contains the tributaries and supplies the surface runoff that feeds the river is called the **drainage basin**.

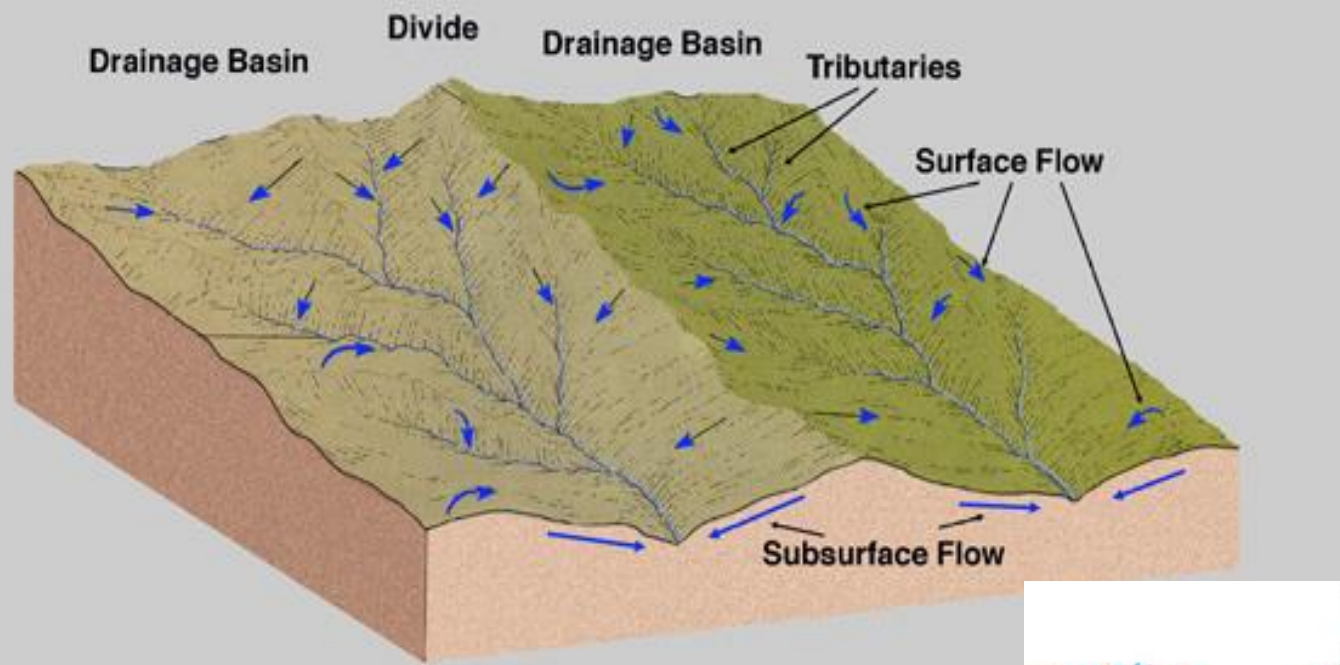
Typically, ridges that form a valley or bowl-shaped depression that channels the water towards the river bound the drainage basin.

The red line shows the watershed for a river basin. Any precipitation that falls on the other side of the watershed will flow into a river in the adjacent river basin.



People change the water cycle.

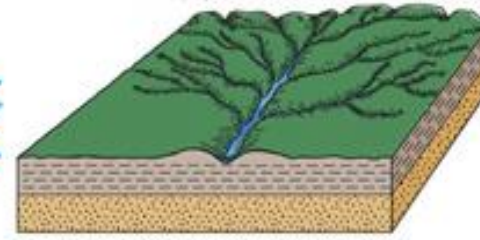




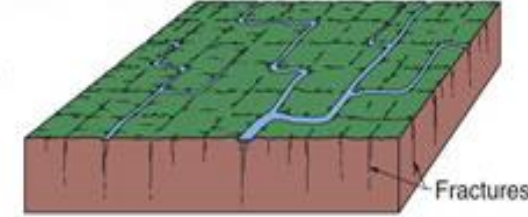
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A Dendritic



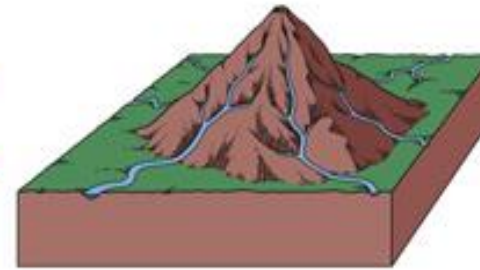
C Rectangular



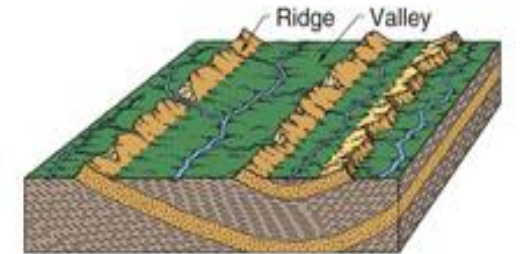
Fractures



B Radial



D Trellis



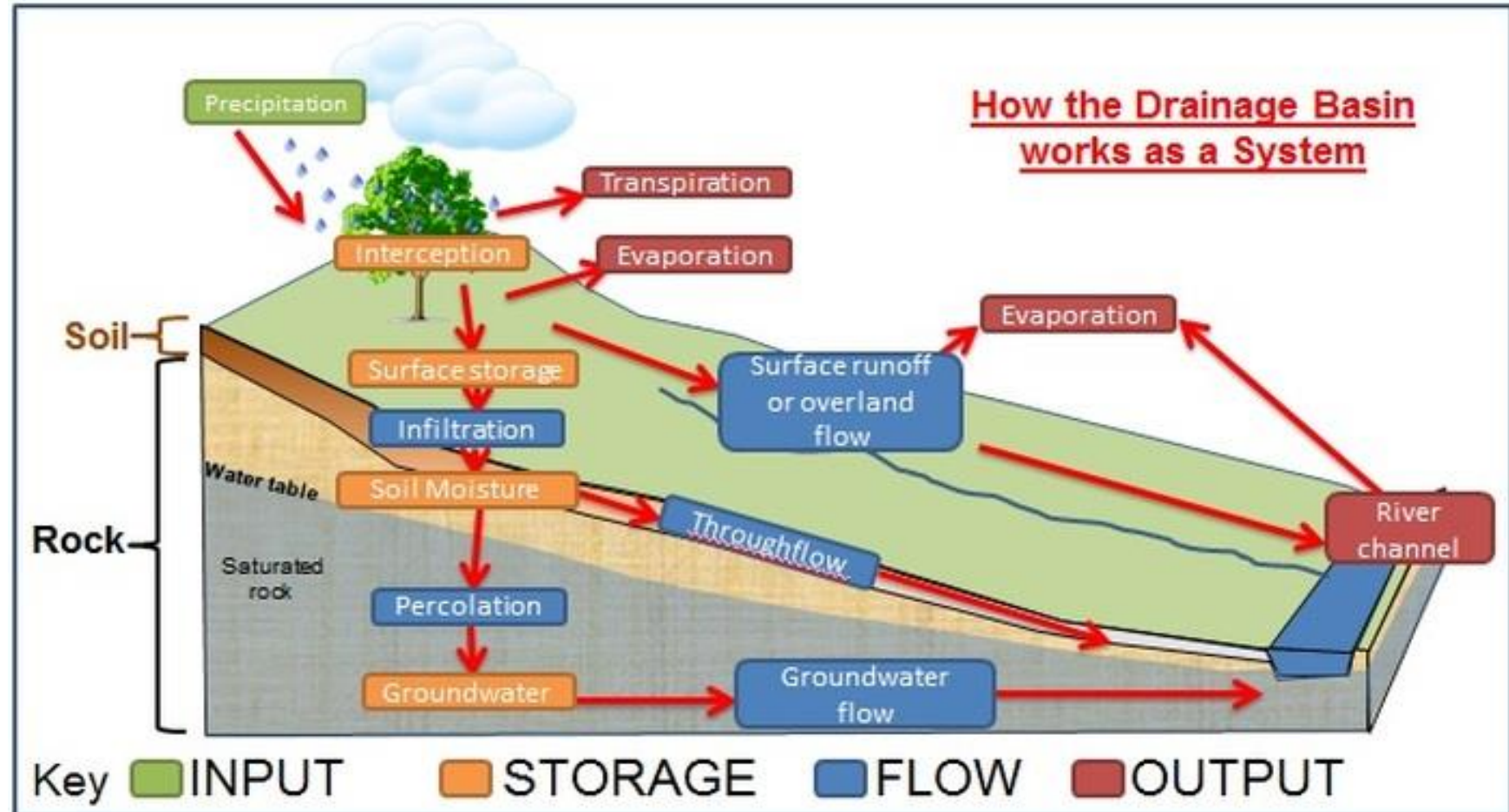
Ridge Valley

Types of the watershed.

Ways back to the sea- a systems diagram.

The cycle has a:

1. Single input -precipitation
2. Two major losses (outputs) – evapotranspiration and runoff.
3. A third output –leakage, may also occur from the deeper subsurface to other basins.



Inputs, outputs, stores and transfers.

Inputs include precipitation (including rain and snow) and solar energy for evaporation.

Outputs move moisture out of the drainage basin and include evaporation and transpiration from vegetation (together known as evapotranspiration), run-off into the sea and percolation of water to underlying rock strata into underground stores.

Inputs, outputs, stores and transfers.	
<p><u>Inputs:</u> When water is added to a drainage basin.</p>	<p><u>Outputs:</u> When water leaves a drainage system</p>
<ul style="list-style-type: none"> • Precipitation 	<ul style="list-style-type: none"> • Evaporation • Transpiration • Evapotranspiration • River runoff
<p><u>Stores:</u> When water is stationary and not moving in a drainage basin.</p>	<p><u>Transfers:</u> When water is moving within a drainage basin.</p>
<ul style="list-style-type: none"> • Interception • Ground water store • Soil water store • Vegetation Store • Channel Store 	<ul style="list-style-type: none"> • Through fall • Stem Flow • Overland Flow • Infiltration • Through flow • Percolation • Ground Water Flow • Channel Flow

Task 2:

1. What do you understand by the terms input and output?
2. Suggest two places on the diagram where each of the following take place:
 - water is stored
 - Water flows or is transferred
 - Water changes its state from liquid to gas.