

GEOGRAPHY

FOR EDEXCEL

A LEVEL YEAR 2

REVISION GUIDE

Matched to Oxford's **Geography for Edexcel A Level Year 2** student book, this Revision Guide is for use with the Edexcel A Level Geography specification. It provides:

- ◆ colourful, visual, easy to digest content that matches the Edexcel exam specification
- ◆ revision planner to help monitor your progress
- ◆ top tips for exam success to help you gain every available mark

Bullet points of **key content** at the start of each topic

Cross-references to the Student Book allow you to re-read topics in depth

Short and clear explanations of the **big ideas** around which your A Level has been written

Ten-second summaries give you the essentials to remember, like ready-made flashcards

Over to you activities help embed knowledge and hone exam skills

1.3 Local hydrological cycles – drainage basins

You need to know:

- that the hydrological cycle is a system of linked processes
- that physical factors determine the significance of inputs, flows and outputs
- that humans impact on the drainage basin cycle.

Open systems

An area drained by a river and its tributaries is a **drainage basin**, within which local hydrological processes operate (Figure 1). They are also known as **catchment areas** as they 'catch' the precipitation falling within a **watershed**.

Unlike the global hydrological system, drainage basins are **open systems**. This means that:

- inputs are not determined by the outputs of the system.
- Open systems can lose more water than they receive – by evaporation and evapotranspiration, runoff and percolation.

Hydrological processes

Precipitation can follow just three pathways: **infiltration, overland flow (surface runoff) and evaporation** (Figure 2). These pathways can be defined by:

- Interception** by plants or buildings before evaporation or infiltration into the surface
- percolation** through rocks as **groundwater** and subsequent storage in **aquifers**

Drainage basin factors

Natural movement of water within a drainage basin is controlled by solar energy and gravity. Different factors control how precipitation reacts on reaching the land surface. These are **basin-wide factors** and include:

- relief
- climate
- vegetation
- geology
- land use
- drainage density.

Local hydrological cycles – drainage basins

The precipitation input

When warm moist air rises, it cools and condenses to form clouds, resulting in precipitation. The UK experiences three types of rain (Figure 3) in which air is forced to rise in three different ways.

- Drainage basins in western UK are exposed to warm moist air masses from the Atlantic and are prone to **orographic rainfall** (also known as **relief rainfall**) because it falls over high ground or **frontal rainfall** (associated with low pressure). They tend to have high **water tables** and **antecedent moisture**, where water from one storm hasn't cleared by the time the next arrives.
- Because the western hills force orographic rain to fall in the west and north, eastern UK lies in a **rain shadow**, making it drier.
- In summer, in the clear drainage basins in eastern UK, the warm ground heats air above it, which rises, causing **convective** air instability and thunderstorms. This can lead to **flash floods** and rapid runoff on dry soils.

Human impacts on drainage basins

Human activities have impacts on drainage basins (Figure 4).

Human activity	Effect
Clear deforestation	Accelerating too much water from groundwater can lead to trees dying off during low rainfall.
Deforestation	Human forests focus on the soil, so removal of these change the insulating effects of forests, natural interceptors and the natural water cycle.
Change in land use, e.g. urbanisation	More impermeable surfaces mean decreased runoff and reduced infiltration and evapotranspiration. Increased demand for water means more storage is needed and more abstraction from groundwater.
Reservoirs	Building new reservoirs or increasing abstraction means demand but changes the natural water cycle by blocking the flow of water and removing water from the drainage basin. These water reservoirs gradually form reservoirs that is used by people.

Ten-second summary

- Drainage basins are open systems on which local hydrological processes operate.
- Precipitation follows one of three pathways.
- Different physical factors affect the movement of water within the drainage basin.
- Different types of rainfall affect local hydrological systems.
- Human activities can impact on the hydrological cycle.

Over to you

Choose ten key terms at random from this section (in bold) and define as many as you can. Where relevant, classify them as inputs, outputs, stores or flows.

Guided answers are available at www.oxfordsecondary.co.uk/geography-answers

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