MY REVISION NOTES

HODDER EDUCATION

Pearson Edexcel

International GCSE (9–1)

GEOGRAPHY

- Plan and organise your revision
- Reinforce skills and understanding
- Practise exam-style questions

MY REVISION NOTES Pearson Edexcel International GCSE (9–1) GEOGRAPHY

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My Revision Planner

	REVISED	TESTED	EXAM READY

4 Economic activity and energy

5 Rural environments

6 Urban environments

REVISED | TESTED | EXAM READY

7 Fragile environments and climate change

	REVISED	TESTED	EXAM READY

8 Globalisation and migration

9 Development and human welfare

Countdown to my exams

6–8 weeks to go

- Start by looking at the specification — make sure you know exactly what material you need to revise and the style of the examination. Use the revision planner on pages 4 and 5 to familiarise yourself with the topics.
- Organise your notes, making sure you have covered everything on the specification. The revision planner will help you to group your notes into topics.
- Work out a realistic revision plan that will allow you time for relaxation. Set aside days and times for all the subjects that you need to study, and stick to your timetable.
- Set yourself sensible targets. Break your revision down into focused sessions of around 40 minutes, divided by breaks. These Revision Notes organise the basic facts into short, memorable sections to make revising easier.

REVISED

2–6 weeks to go

- Read through the relevant sections of this book and refer to the exam tips, summaries, typical mistakes and key terms. Tick off the topics as you feel confident about them. Highlight those topics you find difficult and look at them again in detail.
- Test your understanding of each topic by working through the 'Now test yourself' questions in the book. Look up the answers at the back of the book.
- Make a note of any problem areas as you revise, and ask your teacher to go over these in class.
- Look at past papers. They are one of the best ways to revise and practise your exam skills. Write or prepare planned answers to the exam practice questions provided in this book. Check your answers online and try out the extra quick quizzes at **www.therevisionbutton.co.uk/myrevisionnotesdownloads**
- Use the revision activities to try out different revision methods. For example, you can make notes using mind maps, spider diagrams or flash cards.
- Track your progress using the revision planner and give yourself a reward when you have achieved your target.

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One week to go

- Try to fit in at least one more timed practice of an entire past paper and seek feedback from your teacher, comparing your work closely with the mark scheme.
- Check the revision planner to make sure you haven't missed out any topics. Brush up on any areas of difficulty by talking them over with a friend or getting help from your teacher.
- Attend any revision classes put on by your teacher. Remember, he or she is an expert at preparing people for examinations.

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The day before the examination

- Flick through these Revision Notes for useful reminders, for example the examiners' tips, examiners' summaries, typical mistakes and key terms.
- Check the time and place of your examination.
- Make sure you have everything you need — extra pens and pencils, tissues, a watch, bottled water, sweets.
- Allow some time to relax and have an early night to ensure you are fresh and alert for the examinations.

REVISED

My exams

Paper 1 Physical geography

Date: ....

Time: ....

Location: ....

Paper 2 Human geography

Date: ....

Time: ....

Location: ....

1 River environments

1.1 The hydrological cycle

Characteristics, stores and transfers

REVISED

The Earth's water is constantly recycled in a closed system called the hydrological cycle. Figure 1.1.1 shows that water can be held for varying periods of time in a number of stores, namely:

- in oceans and seas
- on land as rivers, lakes and reservoirs
- in bedrock as groundwater
- in the atmosphere as water vapour and clouds.

Over 97% of the world's water is stored in oceans and seas. This water is of course saline. Of the rest of the world's water (<3%) which is fresh, just over 2% is held as ice and snow with most of this in Antarctica and Greenland. This is followed by 0.6% as groundwater, and 0.1% in rivers, lakes and surface reservoirs. Only 0.001% is held in the atmosphere at any one time.

Transfers of water occur between stores by the following processes:

- Evaporation
- Transpiration
- Condensation
- Precipitation
- Overland flow
- Infiltration
- Percolation
- Throughflow
- Groundwater flow

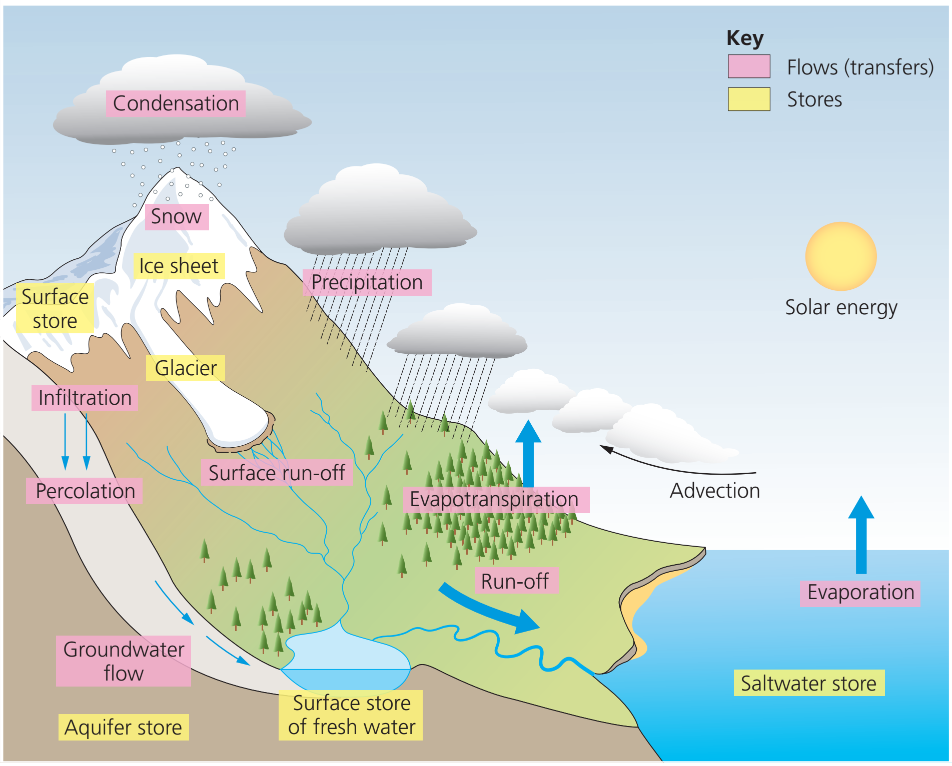

Figure 1.1.1 Processes, stores and transfers in the hydrological cycle

Closed system A system unconnected to other entities. It has no inputs from, or outputs to, elsewhere.

Hydrological cycle The movement of water between air, land and sea.

Stores (of water) Bodies of water that receive, hold and release volumes of water. On land, these include rivers, lakes, reservoirs, and aquifers.

Transfers of water The movement (transfer) of water between stores in the hydrological cycle.

Transpiration The loss of moisture from vegetation into the atmosphere.

Overland flow Water flowing over the surface under the influence of gravity. It occurs when the soil is saturated.

Infiltration The initial movement of water from the surface into the upper level of the soil.

Percolation The downward vertical movement of water within soil or rock.

Throughflow The flow of water through the soil under gravity.

Groundwater flow The flow of water through permeable rock.

Evaporation, condensation and precipitation

These are the three main processes in the hydrological cycle.

Evaporation takes place mainly from surface water. The energy required comes from the sun's heat and from wind. Large amounts of water evaporated from the seas and oceans are carried by air masses onto land. Evapotranspiration is the combined losses of water from the ground, water bodies and vegetation.

Condensation happens when water vapour is cooled to a level known as the dew point. Condensation forms clouds and can also occur at the surface as fog.

Precipitation occurs when water in any form falls from the atmosphere to the surface. This is mainly as rain, snow, sleet and hail. Thus, water is constantly recycled between the sea, air and land.

Evaporation The process in which liquid water is changed into water vapour.

Condensation The process by which water vapour changes into water droplets.

Precipitation Occurs when water in any form falls from the atmosphere to the Earth's surface.

Now test yourself

TESTED

1. List the stores of water in the hydrological cycle in order of volume.
2. Explain the differences between overland flow, throughflow and groundwater flow.
3. Define evapotranspiration.

Revision activity

Draw a labelled diagram to show the relationship between evaporation, condensation and precipitation.

Features of a drainage basin

REVISED

A drainage basin is the area drained by a river and its tributaries (Figure 1.1.2). While the global hydrological cycle is a closed system, the hydrological cycle of an individual drainage basin is an open system as it is open to external inputs and outputs. Drainage basins have a number of distinct features:

- The boundary of a drainage basin is called the watershed. This is a ridge of high land that separates one drainage basin from another.
- The point where a river begins is its source.
- A river reaches the sea at its mouth.
- A tributary joins the main river at a confluence.
- A main river and all its tributaries form a channel network or river system.

Exam tip

When drawing a diagram of the hydrological cycle, ensure that you distinguish clearly between stores and transfers.

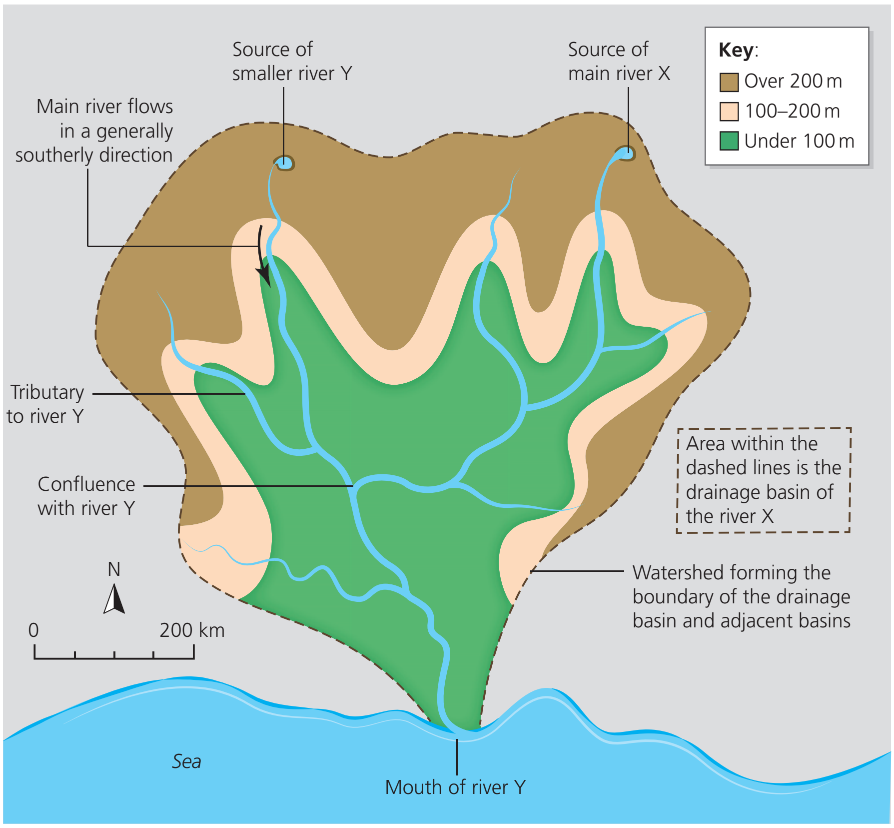

Figure 1.1.2 Features of a drainage basin

Drainage basin The area of land drained by a river system.

Watershed A ridge of high land that forms the boundary between two drainage basins.

Source The origin or starting point of a river.

Mouth The point at which a river flows into a much larger body of water – ocean, sea or lake.

Confluence The point at which a tributary joins a larger river.

Channel network (river system) The pattern of a main river and its tributaries within a drainage basin.

The source of a river

The starting point of a river may be:

- an upland lake
- a melting glacier
- a spring in a boggy upland area
- a spring at the foot of an escarpment.

When small streams begin to flow they act under gravity, following the fastest route down slope. Water is added to them from tributaries, groundwater flow, throughflow and overland flow.

Channel networks

Some main rivers have a large number of tributaries so that no place in the drainage basin is very far from a river. Such an area is said to have a high drainage density. Where a main river has few tributaries, the drainage density is low.

Mouth of a river

Most rivers drain into a sea or ocean, but some drain into lakes which may be far from a coastline. For example, the River Volga, the longest river in Europe, flows into the Caspian Sea.

Revision activity

Name the three longest rivers in the country in which you live.

Exam tip

Remember that the global hydrological cycle is a closed system as it has no inputs or outputs, but the hydrological cycle of an individual drainage basin is an open system as it is open to external inputs and outputs.

Now test yourself TESTED

4 Draw a labelled diagram to show the main features of a drainage basin.
5 Give two sources of rivers.
6 What is a channel network?

Factors affecting river regimes

REVISED

A **river regime** is the variation in the discharge of a river over the course of a year (Figure 1.1.3). The regime of a river is influenced by several factors:

Climate

The most important factor is climate (Figure 1.1.3):

- The river Shannon (Ireland) has a typical temperate regime with a clear winter maximum in discharge, the result of high rainfall beginning in late autumn and subsiding in the spring.
- The river Gloma in arctic Norway has a spring peak associated with snow melt as temperature increases after the cold of winter.
- The river Po near Venice has two main maxima associated with periods of high rainfall in spring and autumn, and spring snowmelt from Alpine tributaries.

For river regimes the type of precipitation occurring is important, e.g. snow in polar and high altitude regions, and thunderstorms with convection rainfall in warm/hot continental interiors in summer. Temperature has a huge effect on evaporation rates – high temperatures lead to more evaporation with less water getting into rivers. However, as warm air can hold more water vapour than cold air, very high precipitation and river discharge can be experienced in hot, moist climates.

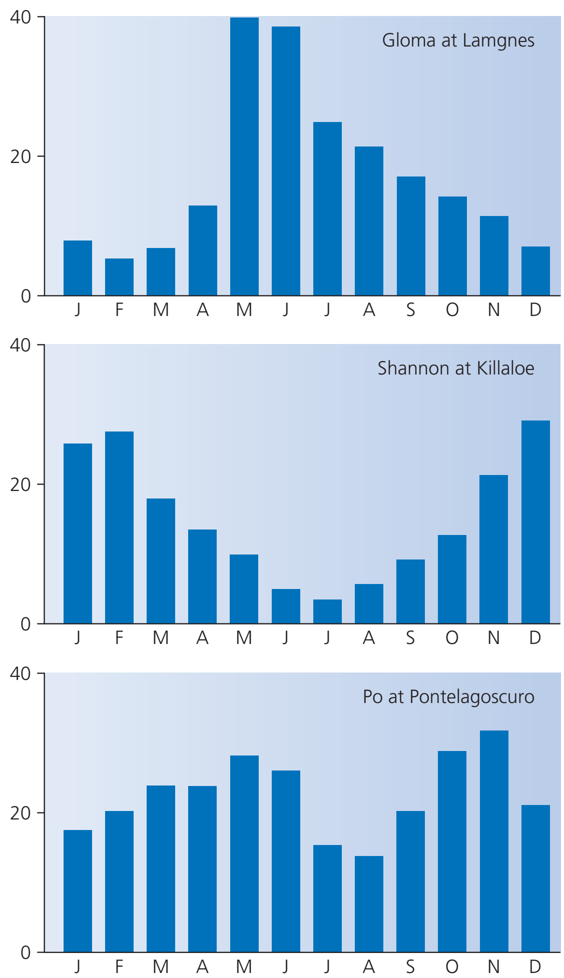

Figure 1.1.3 Three contrasting river regimes for the Shannon, Gloma, and Po

Note: All the graphs show the specific discharge in litres/second per km^2

Vegetation

- High vegetation cover intercepts more rainfall, increases infiltration and reduces overland flow. Broad-leafed vegetation is particularly effective in this respect.
- In winter deciduous trees lose their leaves and so intercept less rainfall.
- Wetlands can hold water and release it slowly into rivers.

Geology and soils

- Permeable rocks allow the accumulation of groundwater which is gradually released into rivers as base flow.
- The more compact the soil surface, the less infiltration and the greater the overland flow.

Base flow The normal discharge of a river, which is altered by storm events.

Water abstraction The removal of water from water bodies from a surface or underground source.

Storm hydrograph A graph showing how the discharge of a river is affected by a storm.

Land use

- Forested areas are most effective in slowing the movement of water to channel networks. In contrast, run off is much faster in areas lacking in vegetation cover.
- Built environments present the highest levels of impermeability, but urban drainage systems are designed to remove surface water as quickly as possible.

Water abstraction and dams

Water abstraction occurs along most rivers of a significant size. Water is abstracted for human consumption, irrigation and other uses. Abstraction a) directly changes surface water flows and b) indirectly lowers groundwater levels. Dams regulate river flow for the purposes of navigation, irrigation, hydropower production and human water supply. The reservoirs of water held behind dams experience significant evaporation, particularly those in hot, dry climates.

Other factors influencing river regimes

- Drainage basin size and shape: small drainage basins respond most quickly to rainfall events.
- Slopes: steeper slopes create more overland flow.
- Drainage density: basins with a high drainage density respond very quickly to storms.

Storm hydrographs

A storm hydrograph (Figure 1.1.4) shows how the discharge of a river varies over a short time period such as 24 hours and usually refers to a single storm (period of rainfall).

- Before the storm begins, water is mainly supplied to the river by groundwater flow (base flow).
- During the storm, some water infiltrates into the local soil while some flows over the surface as overland flow.
- Overland flow, in particular, reaches the river quickly, causing a rapid rise in the level of the river, the rising limb on Figure 1.1.4.
- The peak flow is the maximum discharge of the river as a result of the storm.
- The time lag is the time between the height of the storm and the maximum discharge.
- The recessional limb shows the speed with which the discharge declines after the peak.

The effect of urban development on hydrographs is to increase peak flow and decrease time lag.

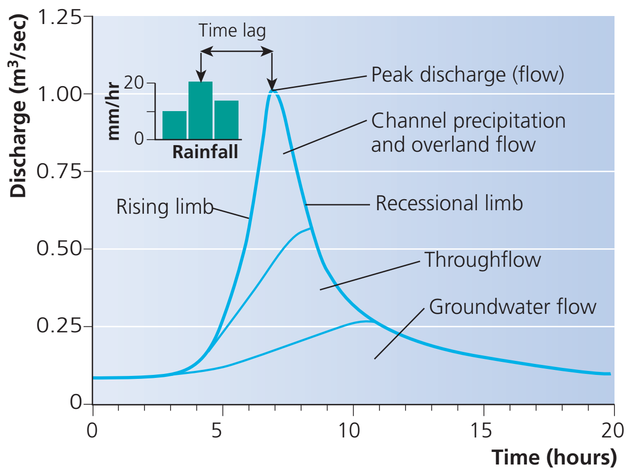

Figure 1.1.4 A storm hydrograph

Exam tip

Remember that a river regime looks at variations in average discharge over the course of a year, while a storm hydrograph records discharge due to a single storm event.

Revision activity

Draw a labelled diagram of a storm hydrograph.

Now test yourself TESTED

7 Define river regime.
8 State two ways in which water abstraction can affect the regime of a river.
9 Explain the time lag on a storm hydrograph.

1.2 Physical processes and river landforms

Fluvial processes and river channel formation

REVISED

Rivers have played a major part in forming the landscape in drainage basins through the fluvial processes of erosion, transportation and deposition. However, two other important landscape processes also operate in drainage basins – weathering and mass movement.

Weathering is the breakdown of rock in situ (not involving movement). For example:

- the freeze–thaw action of physical weathering
- chemical weathering by rainwater, which is slightly acidic, on rocks.

Biological weathering, particularly the root systems of plants and trees gradually breaking rock apart, is also active in drainage basins.

Mass movement is the large-scale movement of weathered material under the influence of gravity. It carries weathered material into rivers which:

- contributes additional material to a river's load
- thereby increasing erosion in the upper course
- and adding to deposition in the middle and lower courses.

The two main types of mass movement in drainage basins are slumping and soil creep.

Fluvial Of or relating to a river or stream.

Weathering The breakdown of rock in situ.

Mass movement The large-scale movement of weathered material under the influence of gravity.

Friction The resistance encountered when one body moves relative to another body with which it is in contact.

Erosion Wearing away of the Earth's surface by a moving agent such as a river.

Energy and processes

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- Around 95% of a river's energy is used to overcome friction.
- The remaining 5% or so is used to erode the river channel and transport this material downstream. The amount of energy in a river is determined by a) the amount of water in the river and b) the speed at which it is flowing.
- Most friction occurs where the water is in contact with the bed and the banks. Rocks and boulders on the bed increase the amount of friction.

Near the source, rivers channels are shallow and narrow. Also, the beds are often strewn with boulders and very uneven. There is much friction and the water flows more slowly here than further downstream where the channel is a) wider, b) deeper and c) less uneven.

Erosion

There are four processes of erosion:

- **Hydraulic action**: the sheer force of river water removing loose material from the bed and banks of the river.
- **Abrasion**: the wearing away of the bed and banks by the river's load.
- **Attrition**: in swirling water, rocks and stones collide with each other and with the bed and banks. Over time the original sharp edges become smooth and the pieces of rock become smaller in size.
- **Solution**: some rocks such as limestone dissolve slowly in river water.

Near the source a river cuts down into its bed, deepening the valley. This is **vertical erosion.** In the middle and lower courses, sidewards or **lateral erosion** is most important. This widens the valley. Most erosion occurs when discharge is high and rivers are said to be in flood.

Transportation

There are four processes by which a river can transport its load: traction, saltation, suspension and solution. Parts of the load which are moved by traction when the discharge of the river is low may be transported by saltation when the discharge is high.

Deposition

Deposition takes place when a river does not have enough energy to carry its load. This can happen when:

- the gradient decreases
- discharge falls during a dry period
- the current slows down on the inside of a meander
- the river enters a lake or the sea.

When a river loses energy, the first part of the load to be deposited is the large, heavy material known as the **bedload**. Lighter material is carried further. The gravel, sand and silt deposited is called **alluvium**. This is spread over the floodplain. The solution load is carried out to sea with much of the clay, the lightest suspended particles.

Table 1.2.1 Factors affecting processes: some examples

Factor	Weathering and mass movement	Erosion, transport and deposition
Climate	Chemical and biological weathering most active in hot, wet climates. Cold, dry climates accelerate physical weathering. Slumping aided when weathered material is saturated by heavy rainfall.	Heavy rainfall → higher discharge → increased action of river processes. Higher temperature → increased evaporation → lower discharge and reduced river action.
Slope	Strong relationship between angle of slope and mass movement (increasing shear-stress).	Steep slopes result in fast-flowing rivers with strong erosive power. Gentle slopes encourage deposition.
Geology	More massive rocks tend to be more resistant to weathering than less massive ones. Limestones particularly prone to chemical weathering (solubility).	Rivers erode valleys with soft rock at a rapid rate. Very porous (chalk) and permeable (carboniferous limestone) rocks may lack surface river flow for all or part of the year.
Altitude	Freeze–thaw (physical weathering) very active for long periods in high altitudes.	Snow melt and melting glaciers have a big impact on river regimes and processes.
Aspect	Colder, north-facing slopes in northern hemisphere have higher rate of physical weathering than south-facing slopes.	Higher rates of evaporation and transpiration on south-facing slopes (northern hemisphere) can affect discharge.

Now test yourself TESTED

1. List the three types of weathering.
2. What is mass movement?
3. List the four processes of river erosion.

Discharge Discharge is defined as the amount of water passing a specific point at a given time (the volume times the velocity). It is measured in cubic metres per second.

Transportation The movement of a river's load by the processes of traction, saltation, suspension and solution.

Load The particles of sediment and dissolved matter carried along by a river.

Deposition The laying down of material carried by rivers or the sea because of a reduction of velocity or discharge.

Revision activity

Draw a labelled diagram to explain the four processes of transportation.

Exam tip

Remember that the factors affecting erosion interact with each other. In any single case, the impact of one factor may be altered through the impact of others.

Channel shape, valley profile, velocity and discharge along the course of the river Tees

REVISED

The Tees is one of the major rivers in North East England. It drains an area of about 1800 square km. The source of the Tees is on the eastern side of the Pennine mountains. The river flows eastwards to the North Sea. The Tees exhibits most of the classic processes and landforms of the upper, middle and lower courses of rivers. Figure 1.2.1 shows how the long and cross profiles of the Tees change from source to mouth as the river's:

- gradient decreases
- depth increases
- width increases
- volume increases
- velocity increases
- discharge increases
- sediment size decreases and shape becomes more rounded.

Gradient The degree of slope of the long profile of a river.

Volume The amount of water in the river.

Velocity The speed of the water.

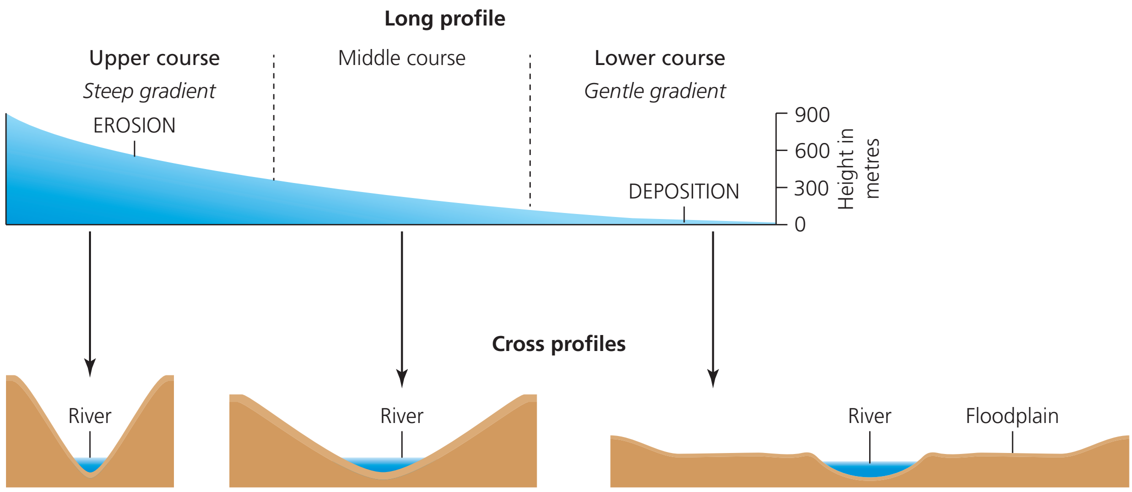

Figure 1.2.1 Long and cross profiles of the river Tees

Upper course

This is mainly an area of moorland where annual precipitation can rise to over 2000 mm per year. The river channel is shallow and narrow. The bed is uneven with sizeable angular boulders in places. There is much friction and the water flows more slowly here than further downstream where the channel is a) wider, b) deeper and c) less uneven.

Vertical erosion has created a steep channel gradient and steep valley sides. Impressive waterfalls are evident along with clear examples of interlocking spurs. High Force is the UK's largest waterfall at 21 metres high. Here a bed of hard rock (dolerite) overlies softer rock (sandstone and shale). As the waterfall has eroded upstream, it has left behind an impressive gorge.

Figure 1.2.2 High Force waterfall

Middle course

Below Middleton-in-Teesdale the valley widens out and the channel slope becomes more gentle. Lateral erosion takes over from vertical erosion, forming distinctive meanders. Good examples can be seen near Barnard Castle. The Tees is joined by important tributaries including the rivers Lune, Balder and Greta. The result is a substantial increase in the volume of water in the river.

Lower course

Here the channel gradient is gentle with the river very close to sea level as it meanders across a fertile clay plain. Deposition is the dominant process. The river has now formed much larger meanders, e.g. near Yarm, across its wide floodplain. Oxbow lakes and levees are clearly evident. The original winding river channel below Stockton has been straightened by artificial cuts to aid navigation. The mouth of the Tees is in the form of a large estuary with mudflats and sandbanks.

Revision activity

Draw a labelled diagram of the long profile of a river valley.

Now test yourself TESTED

4 Where is the source of the river Tees?
5 How do the following change along the course of the Tees from source to mouth?
 a) Gradient
 b) Depth
 c) Discharge
6 Name three rivers that join the Tees in its middle course.

Exam tip

The river Tees correlates well with the standard model presented in textbooks. Some rivers do not have such a close relationship for a variety of reasons.

Changes in river landscapes over the course of a river

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Upland landforms

The characteristic river landforms in upland areas are a steep V-shaped valley, a steep gradient, interlocking spurs, potholes, and waterfalls, rapids and gorges.

Rivers begin to meander in the upper course. Erosion is concentrated on the outside banks of these small meanders. This eventually causes **interlocking spurs** which alternate on each side of the river. These spurs are ridges of high land which project towards a river at right angles.

Where the bed is very uneven, pebbles carried by fast, swirling water can become temporarily trapped by obstacles in the bed. The swirling currents cause the pebbles to rotate in a circular movement, eroding circular depressions in the bed called **potholes.**

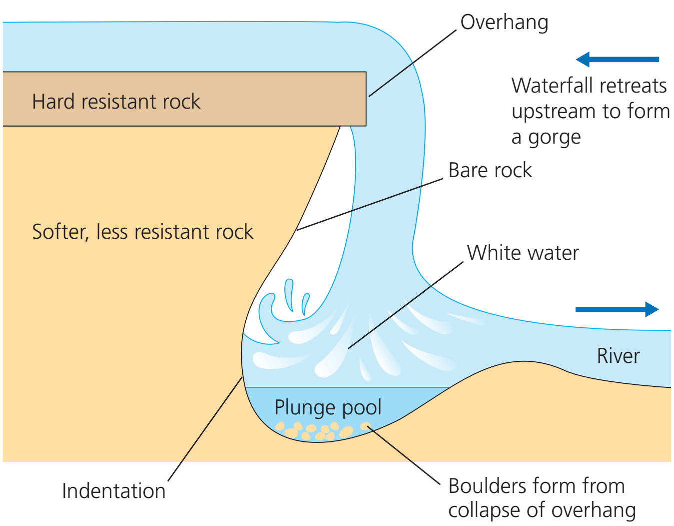

Figure 1.2.3 Formation of a waterfall

- **Waterfalls** occur when there is a sudden change in the course of the river which may be due to differences in rock hardness (Figure 1.2.3).
- Waterfalls can form when the hard rock is horizontal, vertical or dipping upstream. The softer rock is eroded more quickly, causing the hard rock to overhang.
- The undercutting is caused by abrasion and hydraulic action. The overhang steadily becomes larger until a critical point is reached. When this occurs the overhang collapses.
- The rocks that crash down into the plunge pool will be swirled around by the currents. This increases erosion, making the plunge pool deeper.
- This process, beginning with the collapse of a layer of hard rock, will be repeated time after time. As a result the waterfall retreats upstream, leaving behind a steep-sided gorge.

Gorge A narrow, steep-sided valley, often formed as a waterfall retreats upstream.

Lowland landforms

Meanders and meander migration

The volume of water increases as more tributaries join the main river. **Lateral erosion** takes over from vertical erosion as the most important process (Figure 1.2.4). As a result, meanders become larger. The current is fastest and most powerful on the outside of the meander, particularly on the downstream section. Erosion is relatively rapid. The outside bank is **undercut**. Again the emphasis is on the downstream section. Eventually it collapses and retreats, causing the meander to spread further across the valley. If the meander has already reached the side of the valley, erosion on the outside bend may create a very steep slope or river cliff. The current on the inside of the meander is much slower. As the river slows it drops some of its load and deposition occurs. This builds up to form a gently sloping slip-off slope (or point bar). Thus, the water is shallow on the inside of the meander and deep on the outside.

River cliff A steep slope forming the outer bank of a meander. It is formed by the undercutting of the river current.

Slip-off slope The inside bank of a meander where deposition occurs due to slow river flow.

Meander neck A strip of land between two meanders which gradually narrows due to erosion of the outside banks of these meanders.

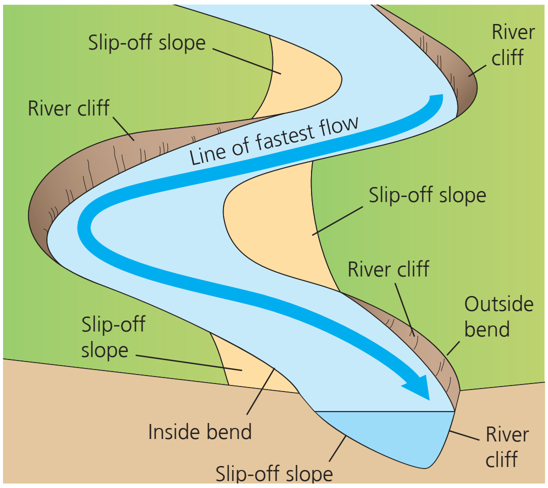

Figure 1.2.4 Cross-section of a meander

Because of the power of lateral erosion in the middle course, meanders slowly change their shape and position. As they push sideways they widen the valley. But they also move or migrate downstream. This erodes the interlocking spurs, giving a much more open valley compared with the upper course.

Meander necks and oxbow lakes

- As a river flows towards its mouth, meanders become more pronounced and the valley becomes wider and flatter.
- As erosion continues to cut into the outside bends of a meander, a meander neck may form (Figure 1.2.5). Eventually, when the river is in flood, it may cut right across the meander neck and shorten its course.
- For a while water will flow along both the old meander route and along the new straight course. However, because the current will slow down at the entry and exit points of the meander, deposition will occur.
- After a time the meander will be cut off from the new straight course to leave an oxbow lake.

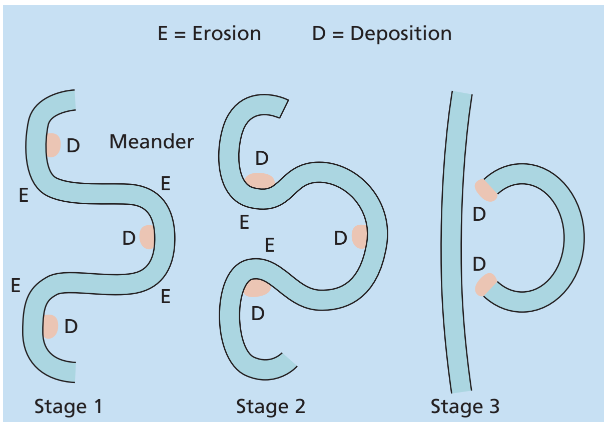

Figure 1.2.5 Formation of an oxbow lake

Answers to Now Test Yourself and Exam Practice questions at www.hoddereducation.co.uk/myrevisionnotesdownloads

Floodplains and levees

A **floodplain** is the area of almost flat land on both sides of a river. It is formed by the movement of meanders explained above. When discharge is high the river is able to transport a large amount of material in suspension. At times of exceptionally high discharge, the river will overflow its banks and flood the low-lying land around it. The sudden increase in friction as the river water surges across the floodplain reduces velocity and causes the material carried in suspension to be deposited on the floodplain. The heaviest or coarsest material will be dropped nearest to the river. This can form natural embankments alongside the river called **levees** (Figure 1.2.6). The lightest material will be carried towards the valley sides. Each time a flood occurs, a new layer of **alluvium** will be formed. This gradually builds up the height of the floodplain.

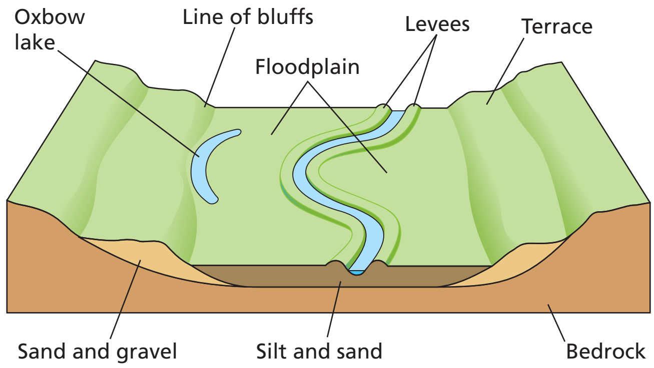

Figure 1.2.6 Cross-section of a river floodplain

Revision activity

Write simple paragraphs to explain the processes operating on the outside and inside banks of a meander.

Now test yourself TESTED

7 List four characteristics of an upland river valley.
8 Draw a fully labelled diagram of a meander.
9 How are levees formed?

Exam tip

When drawing a diagram showing the formation of an oxbow lake, make sure you label where erosion and deposition has occurred.

1.3 The importance of river environments and their management

Uses of water; rising demand; water shortages

REVISED

Uses of water

Global water use increased from 1.22 trillion m^3 in 1950 to over 4 trillion m^3 in 2018. This increase was more than twice the rate of population growth. Current global water use by sector is:

- agriculture: 69%
- industry: 19%
- domestic: 12%.

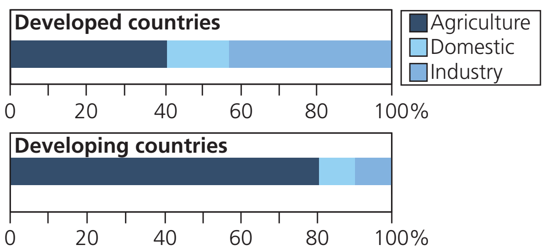

Figure 1.3.1 Water used for agriculture, industry and domestic for the developed and developing worlds

Figure 1.3.1 contrasts water use in developed and developing countries. In developing countries agriculture accounts for over 80% of total water use, with much devoted to irrigation. In developed countries the demand for water for leisure activities has risen significantly.

Irrigation Supplying dry land with water by systems of ditches and also by more advanced means.

Rising demand for water

Global water use has more than tripled since the 1950s due to:

- population growth
- rising living standards
- changing patterns of food consumption (from grain-based to protein-based diets)
- increasing urbanisation
- higher water demand from industry.

Increasing water supply

The objective in all methods of **water supply** is to take water from its source to the point of usage. In 2015, about 91% of the global population had access to piped water supply, up from 76% in 1990. However, over 660 million people still do not have access to an improved water source. Much of the increase in water consumption has been made possible by investment in water infrastructure, particularly dams and reservoirs. In some countries water is delivered on a daily basis to urban areas that are not yet connected to the mains supply.

Water supply The provision of water by public utilities, commercial organisations or by community endeavours.

Potable water Water that is free from impurities, pollution and bacteria, and is thus safe to drink.

Water stress When water supply is below 1700 cubic metres per person per year.

Water scarcity When water supply falls below 1000 cubic metres per person per year.

Areas of water shortage

Water shortage is most pronounced in the Middle East and North Africa, Central Asia and northern India.

Much of the precipitation that falls to the Earth's surface cannot be captured and the rest is very unevenly distributed. The arid regions of the world cover 40% of the world's land area, but receive only 2% of global precipitation.

Water scarcity is to do with the availability of **potable water**. It is threatening to put world food supplies in jeopardy, limit economic and social development, and create serious conflicts between neighbouring drainage basin countries.

- A country is judged to experience **water stress** when water supply is below 1700 m^3 per person per year.
- When water supply falls below 1000 m^3 per person a year, a country faces **water scarcity** for all or part of the year.

Water depletion hotspots are caused by drought, groundwater depletion, ice-sheet and glacier loss/retreat, surface water loss (the drying of the Aral and Caspian Seas), and the filling of large reservoirs (the Three Gorges Dam).

Water surplus

Water surplus occurs when the demand for water is less than the supply. This situation exists mainly in temperate and tropical wet areas and includes large parts of North America and Western Europe, and the Amazon and Congo Basins.

Countries and regions within countries experiencing water surplus tend to have the following:

- Positive geographical characteristics with regard to water – high rainfall and surface run-off, large stores of surface water and significant aquifers. Moderate rates of evaporation can also play a major role.
- Low population density and effective water management (quantity and quality).

Revision activity

List four reasons for the increasing global demand for water.

Now test yourself

TESTED

1. Define potable water.
2. How many people globally do not have access to an improved water source?
3. What is the difference between water stress and water scarcity?

Exam tip

Remember that water supply is water that can be accessed on a regular basis by those people who want to use it. Investment in infrastructure is usually needed for this to happen.

Answers to Now Test Yourself and Exam Practice questions at www.hoddereducation.co.uk/myrevisionnotesdownloads

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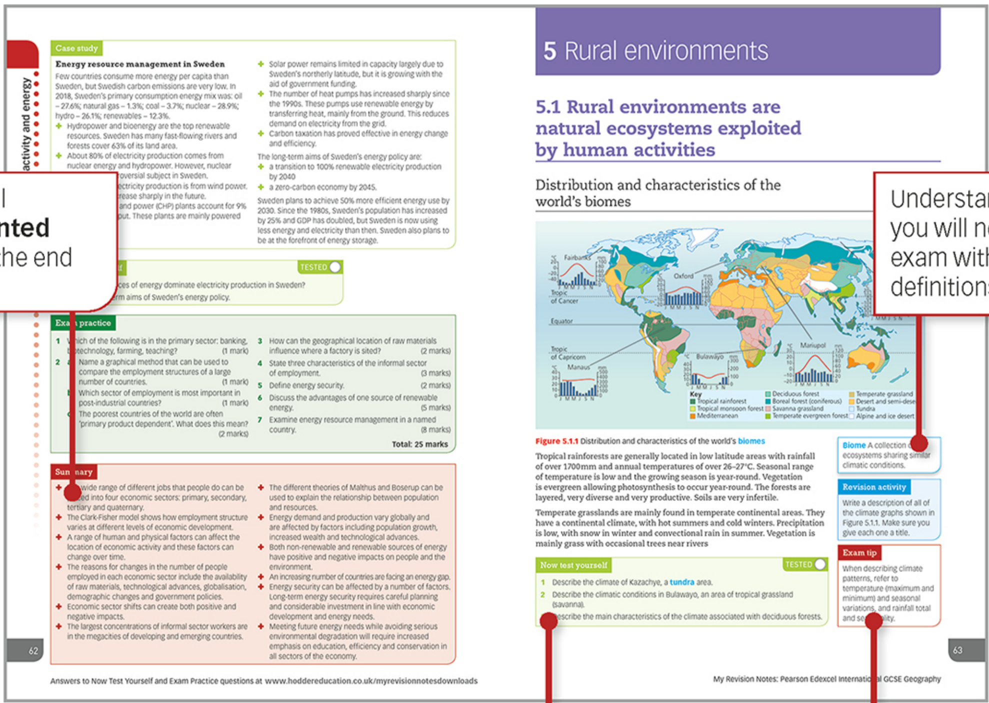

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