MY REVISION NOTES

HODDER EDUCATION

OCR

GCSE (9–1)

GEOGRAPHY A

SECOND EDITION

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

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MY REVISION NOTES
OCR GCSE (9–1)
GEOGRAPHY A

Boost

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My revision planner

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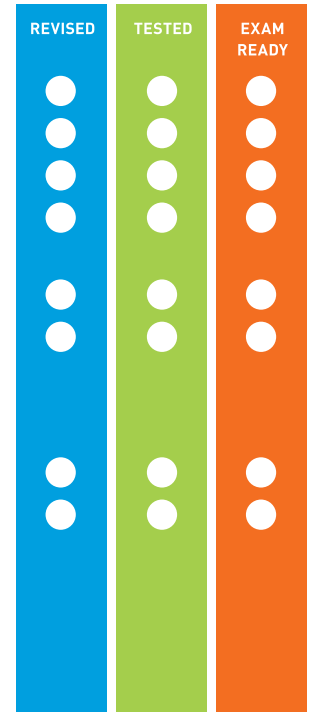

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Countdown to my exams

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.

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2–6 weeks to go

- Read through the relevant sections of this book and refer to the exam tips 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 online at **www.therevisionbutton.co.uk/myrevisionnotesdownloads**.
- Make a note of any problem areas as you revise, and ask your teacher to go over these in class.
- Look at sample and/or 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 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, they are 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 exam tips 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.

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My exams

Paper 1 Living in the UK today

Date:.....

Time: .....

Location: .....

Paper 2 The world around us

Date:.....

Time: .....

Location: .....

Paper 3 Geographical skills

Date:.....

Time: .....

Location: .....

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1 Landscapes of the UK

The physical landscapes of the UK

How are landscapes distributed in the UK?

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The UK enjoys a huge variety of distinctive physical landscapes, including spectacular mountains (such as the Lake District in northern England and the Cairngorms in Scotland), rolling hills and valleys (much of southern England) and flat wetlands (such as the Somerset Levels).

Figure 1 is an atlas map showing the distribution of uplands and lowlands in the UK. Notice that most of the mountainous uplands in northern England, Wales and Scotland were glaciated in the past when the climate was very much colder than it is today. Immense glaciers carved spectacular valleys and created the dramatic landscapes that we associate with these mountainous areas.

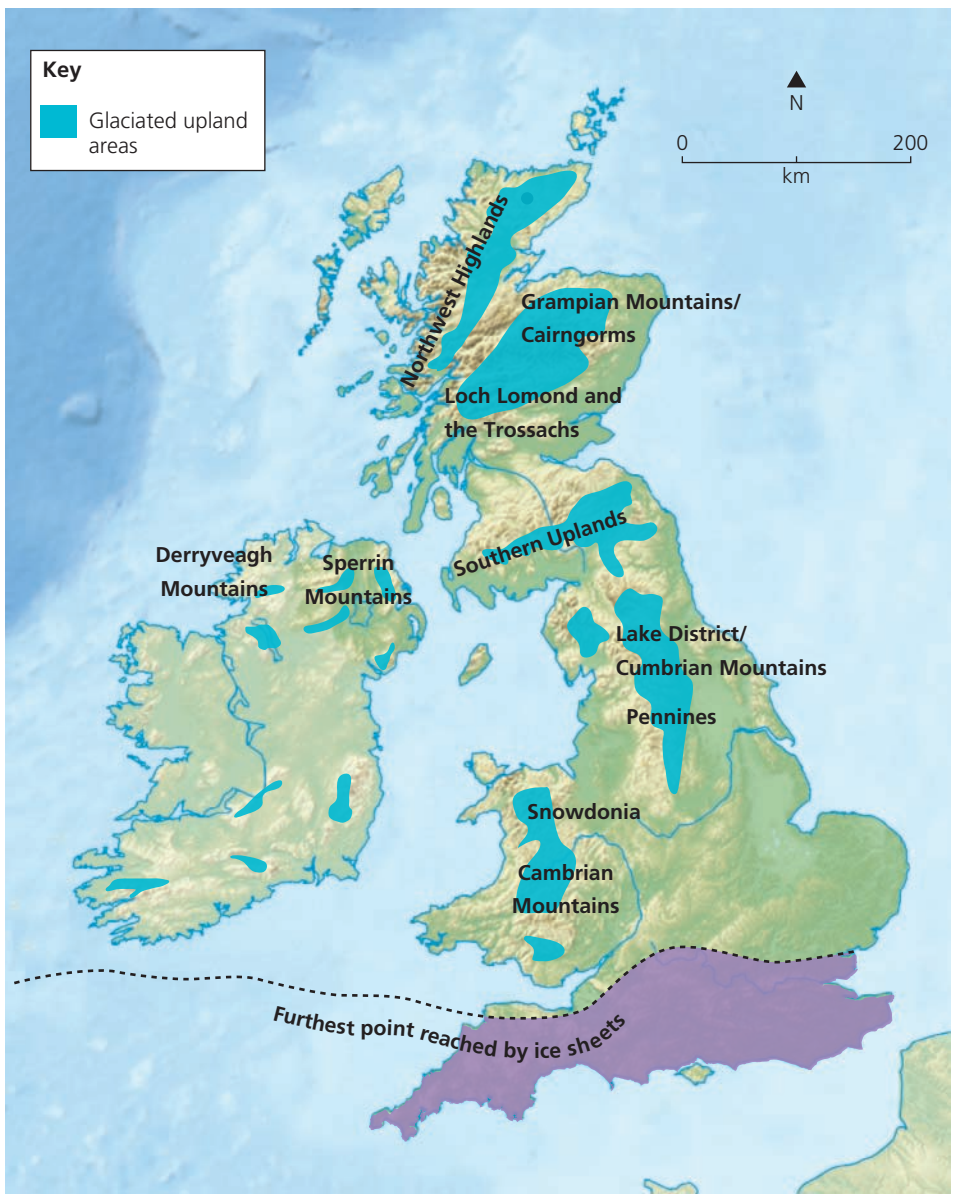

Figure 1 The distribution of upland, lowland and glaciated areas in the UK

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The characteristics of landscapes in the UK

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Geology

Geology is all about the rocks beneath our feet. It is one of the most important factors affecting the physical and human landscapes of the UK. It is possible to identify three types of rock: igneous, sedimentary and metamorphic.

Figure 2 Formation, characteristics and examples of the three rock types

Rock type	Formation	Characteristics	Examples
Igneous	Magma that has cooled either on the ground surface (extrusive) when a volcano erupts or below the ground (intrusive)	Tough and resistant to erosion; igneous rocks often form uplands	Dartmoor (granite), Northern Ireland (basalt), Cuillin Hills (gabbro)
Sedimentary	Rocks formed from the accumulation and compaction of sediment, usually in the ocean	Variable resistance to erosion; chalk and limestone are resistant and will form uplands, whereas weaker clays and sands form lowlands	Chalk ridges and escarpments (for example, Lincolnshire, the Chilterns and the South Downs), limestone (for example, the Pennines), and sands and gravels (for example, lowlands in southern England)
Metamorphic	Existing rocks that have undergone change due to extreme heating or pressure	Very tough and resistant to erosion, often forming uplands	Slate, schist and gneiss form uplands (for example, Snowdonia and the Scottish mountains)

Figure 3 is a simplified map showing the geology of the UK. The great range of colours representing different rocks explains the variety of UK landscapes.

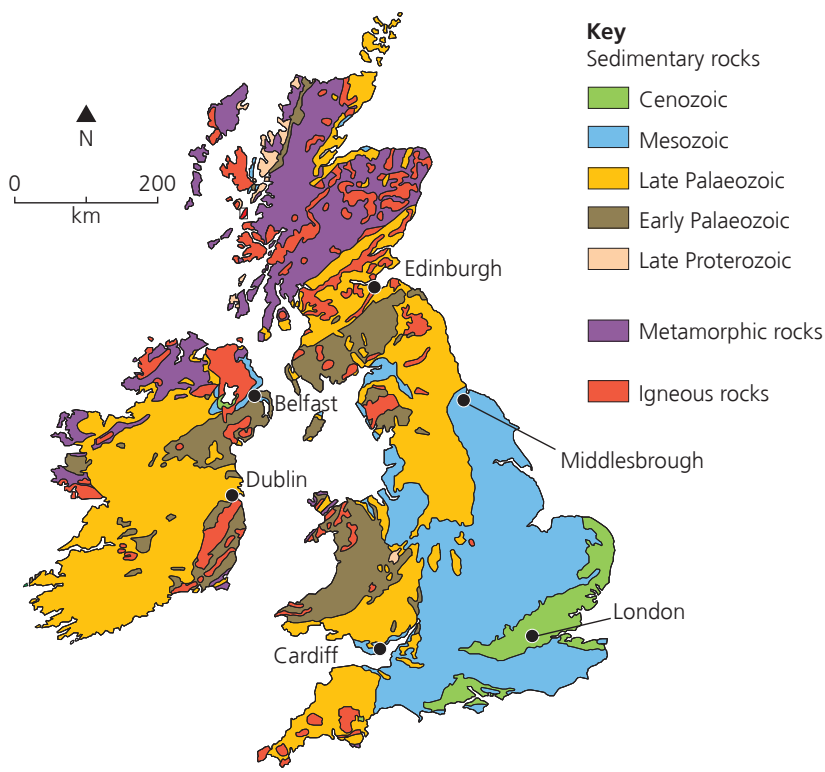

Figure 3 Simplified geological map of the UK

Geology has also had an influence determining the location of built landscapes. Some rocks are valuable sources of energy (such as coal) or contain raw materials (such as metal ores found in limestone). Where these rocks occur at or close to the surface, they have encouraged industrial location and urbanisation. In the north-east of England, the development of Middlesbrough was based on nearby mineral resources, which supplied the local chemical industry.

Geology: the study of rocks and their formation, structure and composition

Igneous: when referring to rocks, this means rocks formed within the interior of the Earth, and shaped by heat

Sedimentary: rocks that have been produced from layers of sediment, usually at the bottom of the sea

Metamorphic: rocks that have been changed as a result of heat and pressure being applied to them over long periods of time

Urbanisation: the process of towns and cities developing and becoming bigger as their population increases

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Use a summary table to describe the **formation** and **landscape characteristics** of igneous, sedimentary and metamorphic rocks.

Answers online

Climate

Climate is the long-term average weather conditions, calculated over a period of 30 years. It differs from the weather, which is the day-to-day condition of the atmosphere (temperature, humidity, **wind** speed, and so on).

The climate of the UK has a role to play in creating the UK's distinctive landscapes, but it is also affected *by* the landscapes – it is a two-way relationship.

The UK enjoys a maritime climate, with the prevailing (most common) winds blowing across the Atlantic from the south-west. This accounts for the generally high rainfall and moderate temperatures throughout the year.

- **Rainfall**: the uplands – particularly in the west – receive a high proportion of the rainfall, with the lowlands in the south and east tending to be drier. This is because the moist air from the Atlantic is forced to rise and cool over the western uplands, forming rain-bearing clouds. This type of rainfall is called relief rainfall. The drier regions to the east can be described as being in the '**rain shadow**'.
- **Temperatures**: temperatures tend to be lower in the uplands than in the lowlands, with frost and snow being common hazards in the winter. This is because temperature falls on average by 0.6 °C per 100 metres of altitude.

Climate affects physical processes such as **weathering** and erosion.

- The process of **freeze–thaw** is very active in upland areas, resulting in jagged rock surfaces and accumulations of scree on mountainsides.
- Rivers are fast flowing (due to high rainfall) and very erosive in uplands, carving deep V-shaped valleys.
- In the past, extreme cold in the uplands led to the formation of ice caps and glaciers, which carved spectacular landscapes.

Human activity

Human activity has transformed the landscape of the UK from a largely forested landscape at the end of the last ice age (about 10,000 years ago) to the present day's agricultural and urbanised landscape.

- **Uplands**: these areas are sparsely populated due to the harsh climate and steep relief. Human activity is limited to extensive sheep rearing and forestry. Reservoirs have been created in some areas to supply water and to generate hydroelectric power. In recent years, wind farms have been constructed in some upland areas, exploiting the strong winds.
- **Lowlands**: these areas are more densely populated due to the moderate climate and gentler relief. Commercial farming dominates the countryside and much of this landscape is urbanised or criss-crossed by transport and service infrastructure.

Exam practice

1 Outline the main characteristics of the built environment. [2]
2 Describe how human activities have affected the landscape of the UK. [4]
3 Explain how geology and climate have affected the upland landscapes of the UK. [6]
4 Study Figure 3 which shows a simplified geological map of the UK. Identify two features of the distribution of igneous rock shown on the map. [2]
5 Using Figure 1, describe the distribution of glaciated areas in the UK. [3]

Formation: the processes affecting change in the landscape

Landscape characteristics: typical features or landforms associated with a particular rock type, such as chalk or granite

Wind: the movement of air on a large scale over the Earth's surface

Rain shadow: an area or region behind a hill that has little rainfall because it is sheltered from rain-bearing winds

Weathering: the breakdown of material *in situ* by physical, chemical and biological processes; if movement is involved, this becomes erosion

Freeze–thaw cycle: the daily fluctuations of temperature either side of freezing point; when repeated they contribute to physical weathering

Revision activity

Construct a spider diagram to show how geology, climate and human activity affect UK landscapes (uplands and lowlands).

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Geomorphic processes

What are the main geomorphic processes?

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Geomorphic processes are responsible for shaping landscapes. They include weathering, mass movement, erosion, **transportation** and **deposition**.

Weathering

Weathering involves the decomposition or disintegration of rock in its original place at or close to the ground surface. There are two main types of weathering: **chemical weathering** and **mechanical (physical) weathering**.

Figure 1 Processes of chemical and mechanical weathering

Chemical weathering	Mechanical weathering
Carbonation: carbon dioxide dissolved in rainwater forms a weak carbonic acid; this reacts with calcium carbonate (limestone and chalk) to form calcium bicarbonate, which is soluble and can be carried away by water **Hydrolysis**: acidic rainwater reacts with feldspar in granite, turning it into clay and causing granite to crumble **Oxidation**: oxygen dissolved in water reacts with iron-rich minerals, causing rocks to crumble	**Freeze–thaw**: repeated cycles of freezing and thawing causes water trapped in rocks to expand and contract, eventually causing rock fragments to break away (Figure 2) **Salt weathering**: crystals of salt, often evaporated from seawater, grow in cracks and holes, expanding to cause rock fragments to flake away

A third type, **biological weathering**, involves living organisms such as nesting birds, burrowing animals and plant roots. Plant roots may expand in cracks, slowly prising rocks apart. Acids that promote chemical weathering may be active beneath **soils** and rotting vegetation.

Biological weathering: weathering that results from the action of living organisms, such as plants or animals

Soil: the top layer of the earth in which plants grow; it contains organic and inorganic material

Geomorphic processes: processes that result in a change in the nature of landscapes

Transportation: the movement of eroded material

Deposition: the laying down of materials that have been transported and can create new landforms such as beaches

Chemical weathering: the decomposition of rocks involving a chemical change, usually resulting from acidic water

Mechanical (physical) weathering: the disintegration or break-up of rocks without any chemical change

Hydrolysis: chemical breakdown of a material due to interaction with water

Oxidation: a chemical reaction between a substance and the air; it can change its appearance or weaken it

Now test yourself TESTED

1 What is the difference between mechanical and chemical weathering?
2 Outline the process of freeze–thaw weathering.
3 How does the action of plant roots cause weathering to rocks?

Answers online

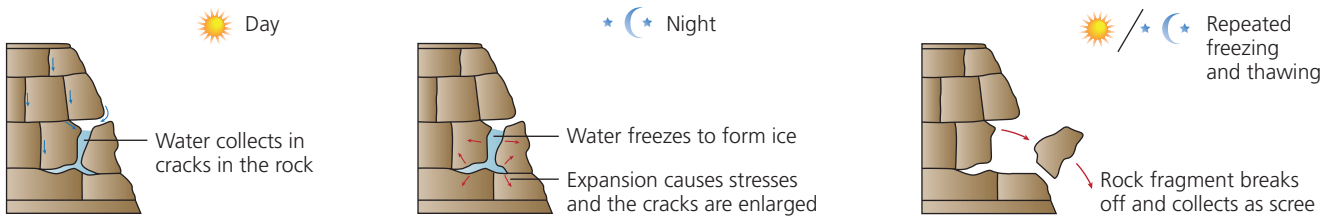

Figure 2 Freeze–thaw weathering

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Mass movement

Mass movement is active at the coast, particularly where cliffs are undercut by the sea, making them unstable. It includes sliding and slumping, as well as falls (rockfalls) and flows (mudflows).

- **Sliding**: this involves rock or loose material sliding downhill along a slip plane, such as a **bedding plane**. Slides are often triggered by ground shaking (for example, an earthquake) or heavy rain.
- **Slumping**: this commonly involves the collapse of weak rock, such as sands and clays, often found at the coast. Slumping often results from heavy rainfall when the **sediments** become saturated and heavy.

Common forms of mass movement at the coast include:

- Rockfall: individual fragments or chunks of rock falling off a cliff face, often resulting from freeze–thaw weathering.
- Landslide: blocks of rock sliding rapidly downslope along a linear shear-plane, usually lubricated by water (Figure 3).
- Mudflow: saturated material (usually clay) flowing downhill, which may involve elements of sliding or slumping as well as flow.
- Rotational slip/slump: slumping of loose material often along a curved shear-plane, lubricated by water (Figure 4).

Mass movement: movement of surface material caused by gravity

Bedding plane: within a sedimentary rock, these represent the points where layers of sediment accumulate; they may later form horizontal weaknesses within the rock along which water may penetrate

Sediment: naturally occurring material that is broken down by processes of weathering and erosion

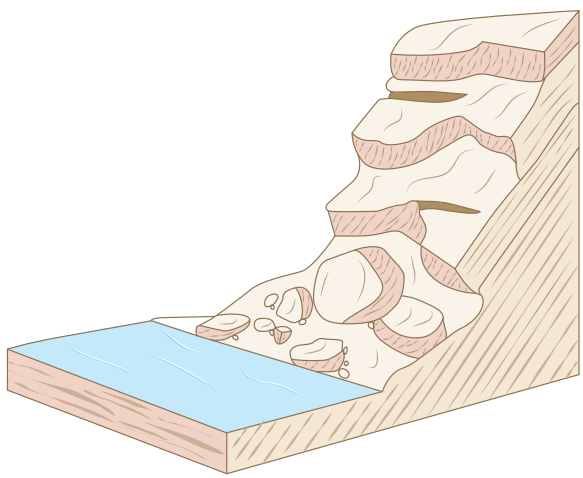

Figure 3 Landslide

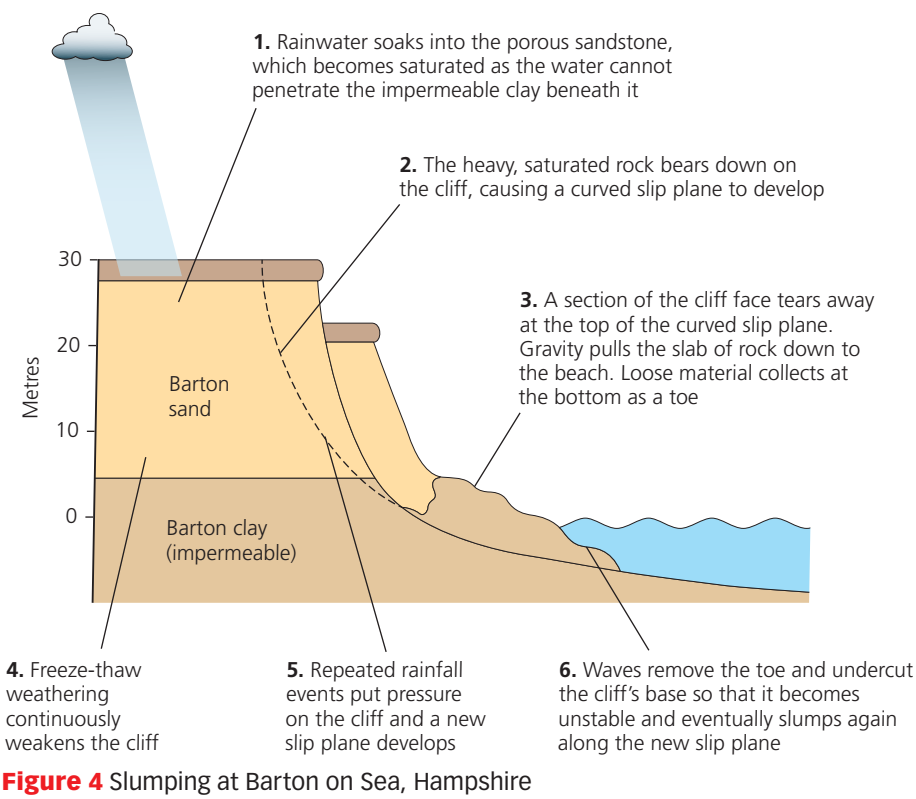

Figure 4 Slumping at Barton on Sea, Hampshire

Revision activity

Make a copy of Figure 3 and add labels to describe the causes and characteristics of sliding.

Now test yourself

Use Figure 4 to describe two causes and two characteristics of slumping.

Answers online

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Erosion

Erosion involves the wearing away and removal of material by a moving force, such as a breaking wave. The main processes of erosion are abrasion, hydraulic action, attrition and solution.

- **Abrasion**: this is the 'sandpapering' effect as loose rock particles carried by the water scrape against solid bedrock. It can also involve loose particles being flung against a sea cliff or river bank by the water – a process sometimes referred to as corrasion.
- **Hydraulic action**: this involves the sheer power of the water, often compressing air into cracks in sea cliffs or river banks, causing rocks to break away.
- **Attrition**: erosion caused when rocks and boulders transported by waves bump into each other and break up into smaller pieces. Over time the rocks become smaller and more rounded.
- **Solution**: the dissolving of soluble rocks, such as chalk and limestone.

Transportation

Transportation involves the movement of eroded sediment from one place to another. It commonly involves the following processes:

- **Traction**: large particles rolling along the seabed.
- **Saltation**: a bouncing or hopping motion by pebbles too heavy to be suspended.
- **Suspension**: particles suspended within the water.
- **Solution**: chemicals dissolved in the water.

Revision activity

Draw a simple diagram to show the four processes of transportation. Set your diagram in a river or at the coast.

Deposition

Deposition occurs when material being transported is dropped due to a reduction in energy. This typically occurs in areas of low energy, where velocity is reduced and sediment can no longer be transported. At the coast, deposition is common in bays or in areas sheltered by bars and spits. In rivers, deposition is common close to the river banks, in estuaries and at the inside bend of meanders.

Exam practice

1 Describe the process of mechanical weathering. [2]

2 Explain the conditions under which hydraulic action will be an important process of coastal erosion. [4]

3 Explain where and why sediment is deposited in rivers and at the coast. [6]

4 Which one of these is a process of transportation in a river environment?

- **A** Chemical weathering
- **B** Hydraulic action
- **C** Slumping
- **D** Suspension

5 Which one of these is a process of mass movement in a coastal environment? [1]

- **A** Abrasion
- **B** Landslide
- **C** Mechanical weathering
- **D** Traction

Erosion: the wearing away and removal of material by a moving force

Abrasion (or corrasion): the scraping, scouring or rubbing action of materials being carried by moving features such as rivers, glaciers or waves, which erode rocks

Hydraulic action: an erosive process that involves the pressure of water hitting a surface, compressing air in any cavities that exist, and resulting in the removal of rock fragments over time

Attrition: a reduction in the size of material

Solution (or corrosion): a type of erosion that involves rock being chemically changed such that it is taken into solution and removed, e.g. the action of acidic water on limestone

Waves: elliptical or circular movement of the sea surface that is translated into a movement of water up the beach as they approach the coastline

Transportation: the movement of eroded sediment from one place to another, you also need to know what is meant by the key terms **traction**, **saltation**, **suspension** and **solution**

Deposition: when material being transported is dropped due to a reduction in energy

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River landforms

The formation of river landforms

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V-shaped valleys

A **V-shaped valley**, as the term implies, is a steep-sided, narrow river valley that takes the form of a V-shape in its cross profile. It is formed by river erosion as the river cuts down vertically into the mountainous landscape. Weathering and mass movement on the valley sides are responsible for broadening the top of the valley profile. Interlocking spurs – 'fingers' of land jutting into the valley – are common landforms in the upper course of a river (Figure 1).

V-shaped valley: a steep-sided, narrow river valley that takes the form of a V-shape in its cross profile

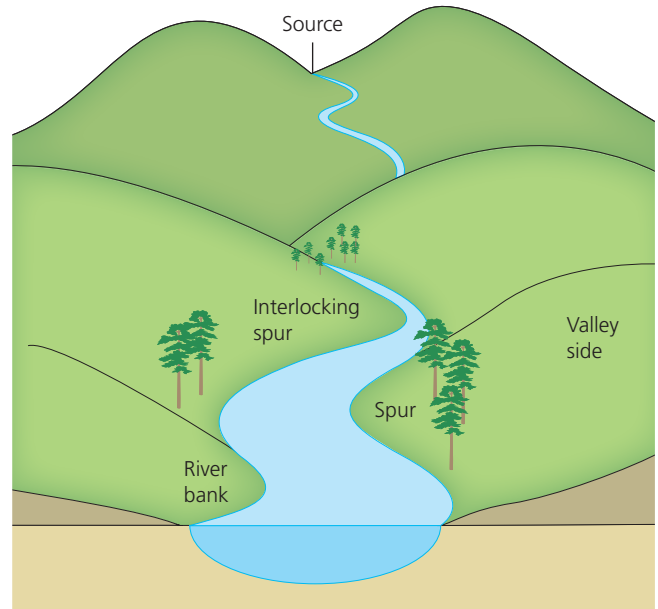

Figure 1 Interlocking spurs

Waterfalls

A **waterfall** is typically formed where fast-flowing water plummets over a vertical cliff – often a considerable drop – into a deep plunge pool below (Figure 2). Hydraulic action and abrasion are mainly responsible for eroding the plunge pool, which can be several metres deep in the centre.

Waterfalls most commonly form when a river flows over a hard, resistant band of rock. Unable to erode the tougher rock, a 'step' is formed in the long profile of the river.

Waterfall: steep fall of river water where its course crosses between different rock types, resulting in different rates of erosion

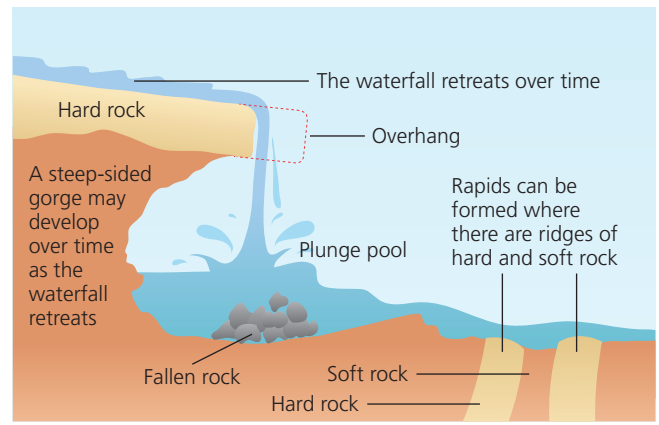

Figure 2 The formation of a waterfall

Gorges

A **gorge** is commonly formed by the upstream retreat of a waterfall (Figure 3).

- Erosion (primarily hydraulic action and abrasion) undercuts the hard rock forming the waterfall to create an overhang.
- Eventually this overhang collapses into the plunge pool causing the waterfall to retreat upstream.
- Over many thousands of years, this process of undercutting and collapse continues and a gorge is formed immediately downstream.

Gorge: a narrow, steep sided valley, often formed as a waterfall retreats upstream

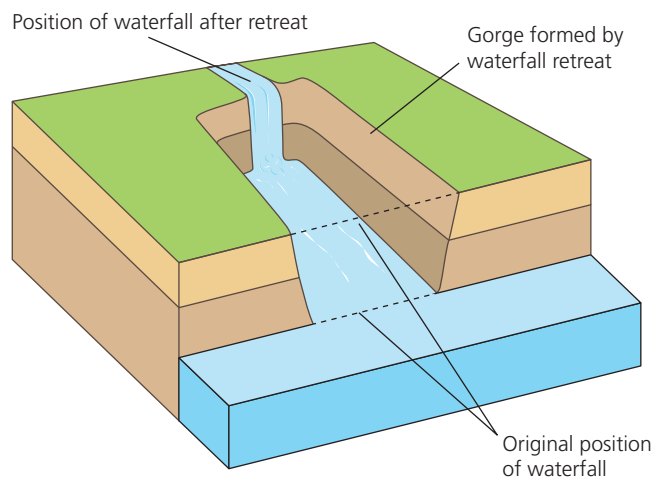

Figure 3 The formation of a gorge

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Meanders

Meanders are commonly found in a river's middle and lower course, where they can form extensive and elaborate bends. The fastest flowing water swings around the outside bend of a meander, eroding the banks to form a river cliff. Here the water is deep. On the inside bend, where the velocity is lower, deposition occurs, forming a slip-off slope. In this way, the meander develops an asymmetrical cross profile (Figure 4). Over time, lateral erosion on the outside bend widens the river valley and creates an extensive, flat **floodplain**.

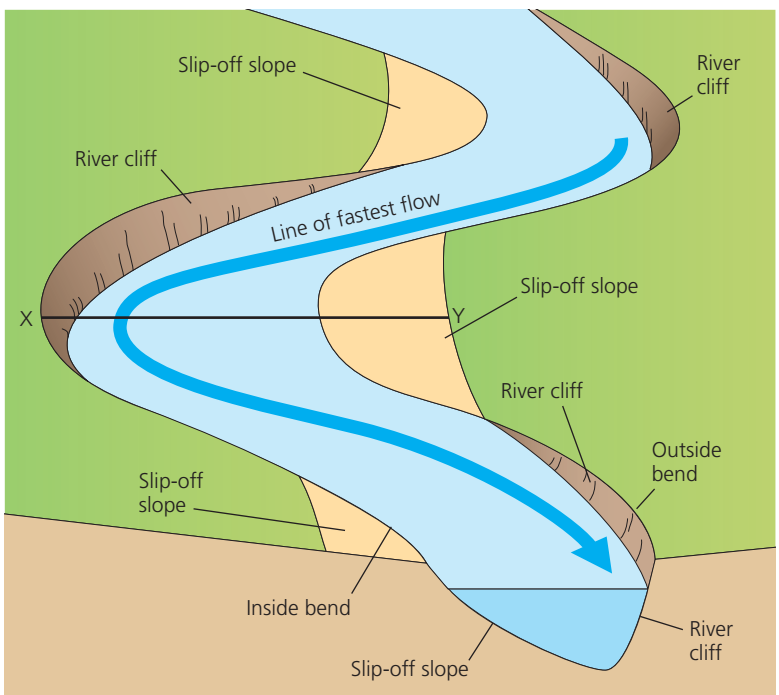
Meander: a bend in a river that results from the flow of water along it

Floodplain: the flat area of land either side of a river channel forming the valley floor, which may be flooded

Meandering rivers are most commonly associated with the following environmental conditions:

- gentle gradients
- relatively fine sediments
- steady precipitation regime throughout the year.

This explains why they are by far the most common river pattern in the UK and, indeed, throughout the world.



Cross profile

Figure 4 Characteristics of a river meander

A common feature of meandering rivers is an alternating pattern of shallows (riffles) and deeps (pools).

- **Riffles**: these shallow areas are associated with the straighter sections of rivers in-between meanders. They usually have rocky beds and turbulent flow due to friction with the river bed.
- **Pools**: these deeper areas are associated with the meander bends. They usually have finer sediment and less turbulent flow due to the smoother river bed.

Now test yourself

Draw a sketch cross profile from X to Y on Figure 4 and explain the formation of the features of erosion and deposition.

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Figure 5 Characteristics of riffles and pools

Rate of flow	Riffle	Pool
High flow (winter)	Greater friction in the shallower riffles results in slower, more turbulent flow	Water tends to flow faster through the deeper pools due to a reduction in friction with the bed and banks
Low flow (summer)	On entering a riffle, the reduction in channel size often results in slightly faster flow	The reduced volume of water tends to slow down on entering a deep pool, where the channel is larger

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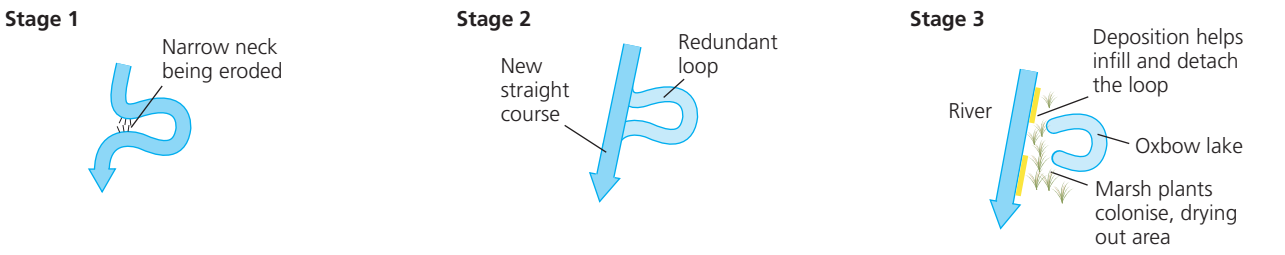
Ox-bow lakes

Ox-bow lakes are typically seen with rivers in their middle or lower course. They represent old meander bends that have been cut off by faster flowing water during times of flood (Figure 6). Gradually, without water flowing through them, they will become filled with silt and marshy vegetation will grow.



- Neck of meander narrows due to lateral erosion on opposite sides of the meander bend.
- During high flow (flood) conditions, the meander neck is broken through.
- The river now adopts the shorter (steeper) route, bypassing the old meander.
- Deposition occurs at the edges of the new straight section, effectively cutting off the old meander.
- The old meander now forms an oxbow lake, separated from the main river.
- Gradually the oxbow lake silts-up to form marshland.

Figure 6 Formation of an ox-bow lake

Now test yourself TESTED

Describe the formation of an ox-bow lake.

Answers online

Ox-bow lake: a horseshoe-shaped lake that forms when a meander is separated from the main river channel as a result of erosion

Levee: raised banks along a river

Levees

Levees are raised river banks commonly found in the lower courses of rivers. They are formed during flood conditions when water flows over the river banks on to the surrounding floodplain (Figure 7) in a sequence of steps:

1. As water overtops the river banks, there is a sudden localised reduction in the velocity of the water, which had previously been flowing very fast along the river channel.
2. This causes sediment in suspension to be deposited at the river bank.
3. Coarse (heavier) sediment is deposited first and this traps the finer sediment.
4. With each successive flood, the deposited sediment raises the river banks by as much as a few metres.

Levees can be created artificially by people to contain water within a river channel to reduce the threat of flooding. In the USA, the term 'levee' is most commonly used for the artificial form.

Now test yourself TESTED

Use a series of simple diagrams to explain the formation of a levee.

Answers online

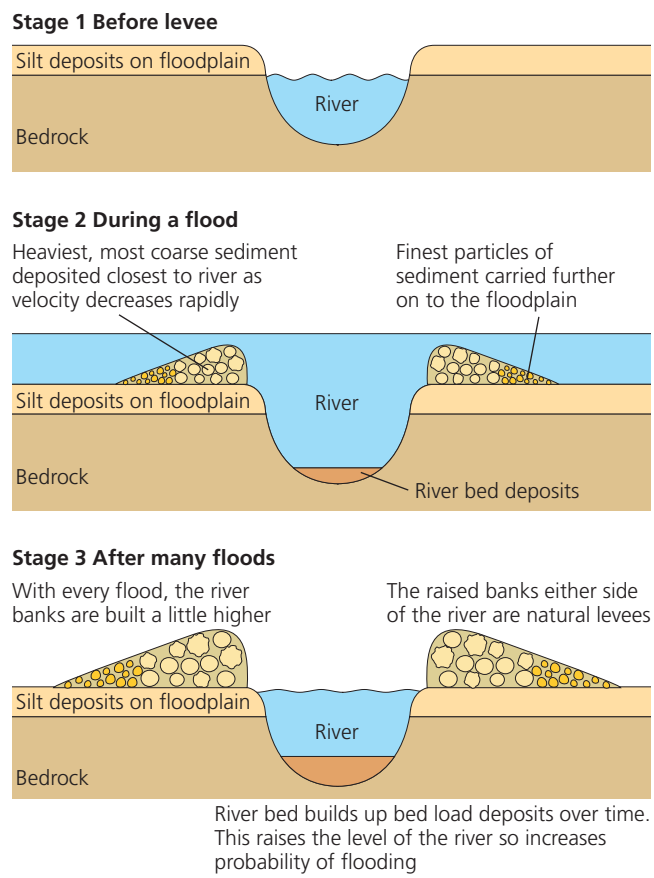


Figure 7 Formation of a levee

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Floodplains

Floodplains are associated with rivers in their middle and lower course. They are extensive, flat areas of land mostly covered by grass. There may be some marshy areas close to the river, and also ox-bow lakes (Figure 8).
As the name implies, they are formed during flood conditions and are periodically and quite naturally inundated by water.

1 During a flood, water containing large quantities of alluvium (river silt) pours out over the flat valley floor.
2 The water slowly soaks away, leaving the deposited sediment behind.
3 Over hundreds of years, repeated flooding forms a thick alluvial deposit that is fertile and often used for farming.

Floodplains become wider due to the lateral erosion of meanders.

1 When the outside bend of a meander meets the edge of the river valley, erosion will cut into it, thereby widening the valley at this point.
2 As meanders slowly migrate downstream, the entire length of the valley will eventually be widened.

Now test yourself

TESTED

1 Identify two characteristics of a floodplain.
2 What feature forms the edge of a floodplain?
3 How do floodplains become wider?

Answers online

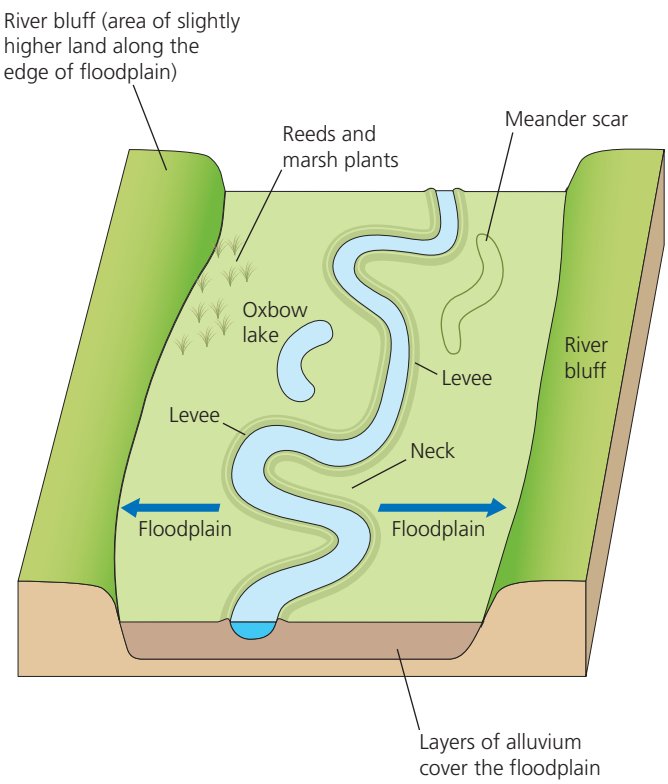

Figure 8 Characteristic features of a floodplain

Exam practice

1 Explain the formation of a V-shaped valley. [4]
2 Describe the characteristics of a waterfall. [4]
3 Explain how the processes of erosion and deposition are responsible for forming the characteristic features of a meander. [6]
4 Explain the formation of levees and floodplains. [6]
5 Describe what an oxbow lake is. [2]

Exam tip

In question 2, focus on the *characteristics* only. You do not need to describe the *formation* of a waterfall and will get no marks for doing so. You could use a labelled diagram to support your answer.

Now test yourself and exam practice answers at www.hoddereducation.co.uk/myrevisionnotesdownloads

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Coastal landforms

The formation of coastal landforms

REVISED

Headlands and bays

Headlands and **bays** are characteristic features of a discordant coastline where rocks of different hardness (resistance to erosion) are exposed at the coast. Headlands form resistant promontories jutting out into the sea. They are separated by bays of less-resistant rock where the land has been eroded back by the sea.

Look at Figure 1. Notice that coastal erosion processes erode away the weaker rocks more readily than the harder rocks to form a sequence of alternating headlands and bays.

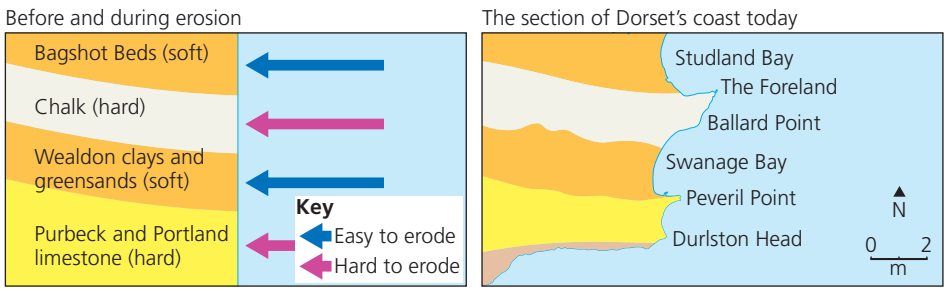

Figure 1 Formation of headlands and bays on the Dorset coast

Erosion at the headlands creates landforms such as cliffs and **wave-cut platforms**. Deposition occurs in the sheltered waters of the bay, forming a beach.

Revision activity

Create your own diagram to show the formation of headlands and bays. Indicate the concentration of erosion at the headland and deposition in the bay.

Caves, arches and stacks

Caves, **arches** and **stacks** are commonly formed at headlands where relatively tough rock juts out into the sea. They are formed in several steps:

1. Cracks in the cliff (**joints** or faults) are eroded and enlarged by hydraulic action to form a wave-cut notch at the base of the cliff. This is eroded further by hydraulic action and abrasion to form a cave.
2. The cave is eroded right through the headland to form an arch.
3. Over time, processes of erosion widen the arch and processes of weathering weaken its roof.
4. Eventually the roof collapses to form an isolated pillar of rock called a stack. Over time the stack will be eroded and will collapse to form a **stump**, which is only exposed at low tide.

Headland: an area of land that extends out into the sea, usually higher than the surrounding land

Bay: an area of the coast where the land curves inwards

Wave-cut platform/notch: a flat area along the base of a cliff produced by the retreat of the cliff as a result of erosive processes

Cave: a natural underground chamber or series of passages, especially with an opening to the surface; also refers to the extended cracks at the base of a cliff

Arch: an arch-shaped structure formed as a result of natural processes within a rock feature such as a cliff

Stack: a coastal feature that results from erosion; a section of headland that has become separated from the mainland and stands as a pillar of rock

Joints: vertical cracks within a rock, such as limestone, which result from the natural shrinking of the rock over time as it was formed; these may form weaknesses allowing water to penetrate the rock

Stump: a coastal feature that results from the collapse of a stack to form a protrusion of rock close to the sea surface

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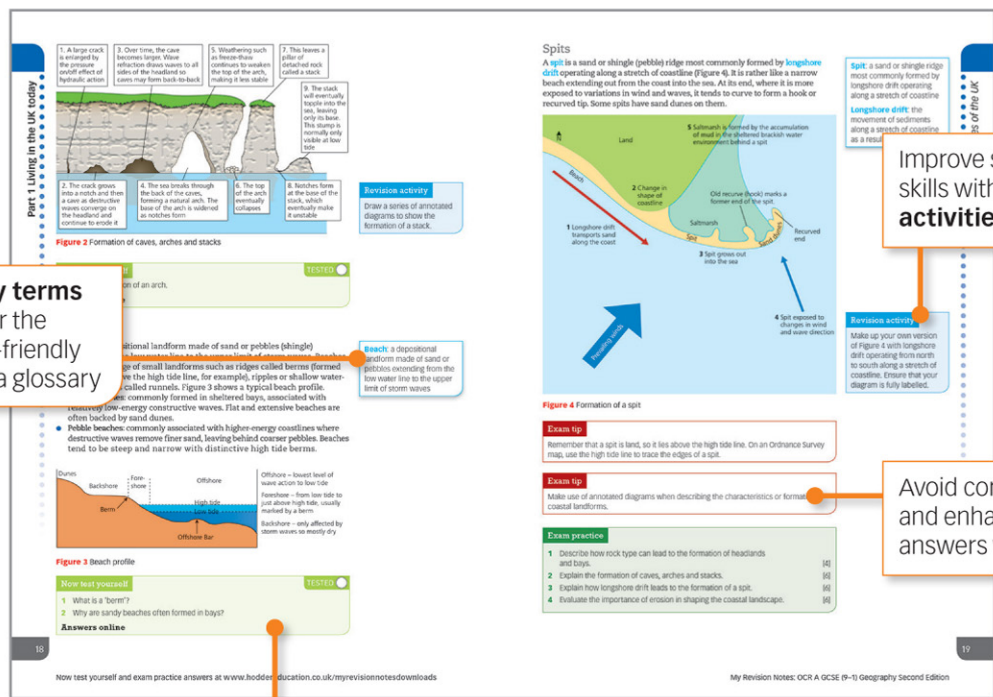

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