For Edexcel GCSE A

Tomorrow's Geography

FIFTH EDITION

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DYNAMIC LEARNING

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Contents

Part 1 The Physical Environment

In the following chapters, you will study the content you need for Component 1: The Physical Environment.

This component is divided into three topics:

Topic 1 The Changing Landscapes of the UK

In this topic you will study **Chapter 1:** The Changing Landscapes of the UK and two of the following chapters:

Chapter 2: Coastal Landscapes and Processes

Chapter 3: River Landscapes and Processes

Chapter 4: Glaciated Upland Landscapes and Processes

Topic 2 Weather Hazards and Climate Change

In this topic you will study **Chapter 5,** an overview of the global circulation of the atmosphere and climate change over time, and look at tropical cyclones and drought.

Topic 3 Ecosystems, Biodiversity and Management

In this topic you will study **Chapter 6,** an overview of the distribution and characteristics of global and UK ecosystems and look in detail at tropical rainforests and deciduous woodlands.

1 The Changing Landscapes of the UK

LEARNING OBJECTIVE

To study the geological variations within the UK.

Learning outcomes

- To know the characteristics and distribution of the UK's main rock types: sedimentary, igneous and metamorphic.
- To understand the role of geology and past tectonic processes in the development of upland and lowland landscapes.

KEY TERMS

Geology – the science that deals with the physical structure of the Earth, its history and how it changes.

Texture – the feel and appearance of a material.

Composition – what a material is made up of.

Fossils – the remnants of prehistoric organisms, such as a fish skeleton or a leaf imprint, which have become embedded in a rock.

There are geological variations within the UK

How did the UK's main rock types form and what are their characteristics?

The UK, although a small country, has a wide variety of landscapes. The **geology** of the UK has played a role in this variety. The main rock types found in the UK that will be discussed in this chapter are sedimentary (chalk and sandstone), igneous (basalt and granite) and metamorphic (schists and slates). These rocks display a number of distinctive characteristics.

Formation of sedimentary rocks

Sedimentary rocks are formed in layers. Many are formed from weathered or eroded rock debris that has been transported and deposited; the deposited rock grains build up in layers called sediments. The weight of the sediments cause the layers at the bottom to become compacted, forming sedimentary rocks such as sandstone. Other sedimentary rocks are formed in the same way; for example, dead sea creatures get compacted on the sea bed into chalk. This process can take millions of years.

Characteristics of sedimentary rocks

Sedimentary rocks:

- are classified by **texture** and **composition**
- usually have layers
- often contain **fossils**
- are composed of rounded grains pushed together
- have a great variety in colour
- are made of particles that may be the same size or vary.

Figure 1.1 Sandstone at Baggy Point, Devon.

Figure 1.2 Chalk cliffs in Kent.

Formation of igneous rocks

Igneous rocks are formed from molten rock called **magma** that is found inside the Earth. When magma cools it forms igneous rocks. If magma cools underground, it cools slowly, forming rocks that contain large **crystals** such as granite. If magma erupts from a volcano, it cools quickly, forming rocks that contain small crystals, as basalt.

Characteristics of igneous rocks

Igneous rocks:

- are formed from molten rock (magma)
- are made from randomly arranged crystals
- are very **resistant** rocks
- do not contain fossils
- may be intrusive, forming inside the Earth, such as granite
- may be extrusive, forming on the Earth's surface, such as basalt.

KEY TERMS

Crystals – a solid material that is arranged in a regular form with definite lines of symmetry.

Resistant – strong rocks that can withstand weathering and erosion.

Figure 1.3 Granite scenery at Haytor on Dartmoor.

Figure 1.4 Drumadoon basalt columns on the Isle of Arran, Scotland.

Formation of metamorphic rocks

These rocks form when igneous or sedimentary rocks are put under great pressure or are close to a source of heat. The rocks are not melted but are heated. Under these two conditions the minerals within the rock change chemically to form a new type of **metamorphic** rock.

Characteristics of metamorphic rocks

Metamorphic rocks:

- are formed from other rocks, either sedimentary or igneous
- are formed under great heat or pressure
- have crystals that can be arranged in layers, for example slate, which is formed from shale
- can contain fossils, although the fossils are usually squeezed out of shape, for example marble.

Figure 1.5 Mica schists in south Devon.

Figure 1.6 Slate extraction in Snowdonia.

Practise your skills

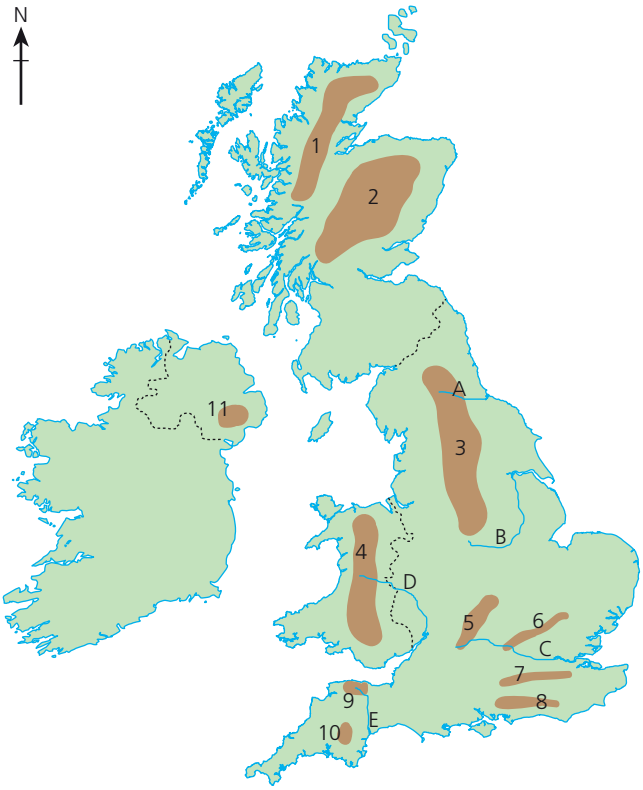
Study Figure 1.7 on page 5. On a blank map of the UK:

1 Locate areas of each of the main rock types.
2 Name an area for each of the main rock types.

The role of geology and past tectonic processes in the development of upland and lowland landscapes

The different types of rocks have varying resistance to physical processes. Igneous and metamorphic rocks tend to be more resistant and therefore form upland, or highland, areas. The igneous and metamorphic rocks in the UK were formed when it had **tectonic** activity. Volcanic cones can still be seen in the UK landscape, for example Abbey Craig near Stirling is built on a volcanic plug (see page 50). The island of Ailsa Craig is also a volcanic plug.

The lowland landscapes are formed from sedimentary rocks. These landscapes are not necessarily flat – they can contain rolling hills, such as the North Downs – but they are much lower landscapes as the rock types are less resistant to physical processes.



Location on map	Name of river
A	River Tees
B	River Trent
C	River Thames
D	River Severn
E	River Exe

Location on map	Name of upland
1	Northwest Highlands
2	Grampian Mountains
3	Pennines
4	Cambrian Mountains
5	Cotswolds
6	Chilterns
7	North Downs
8	South Downs
9	Exmoor
10	Dartmoor
11	Mourne Mountains

Figure 1.7a UK upland areas.

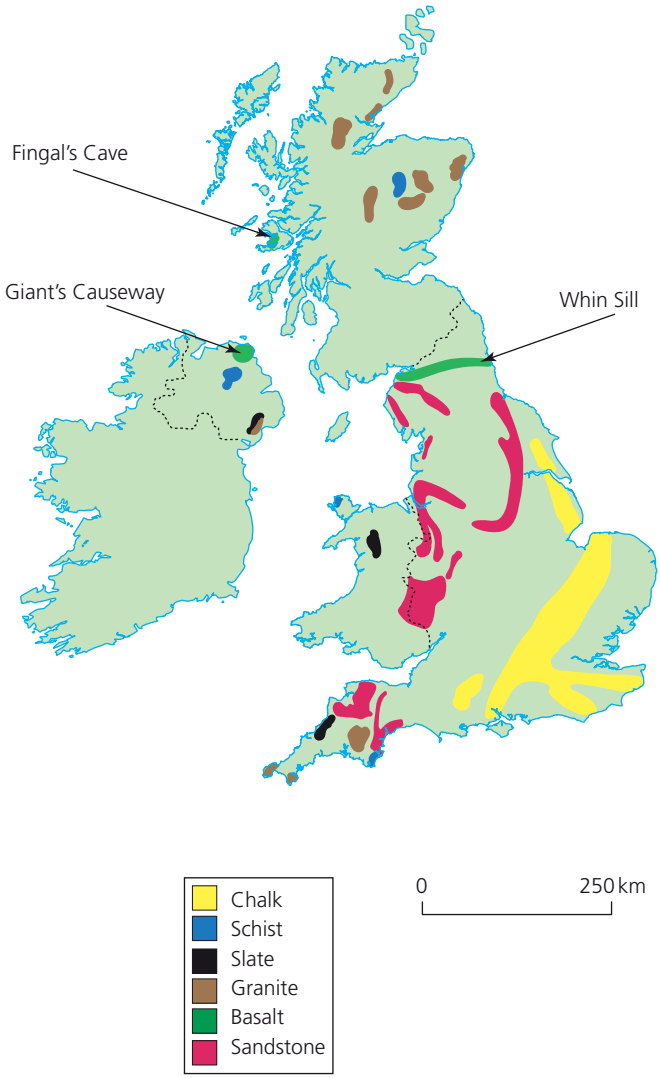


Figure 1.7b Simplified distribution of rock types in the UK.

ACTIVITIES

1 Identify the location of one area of granite landscape in the UK.
2 Is basalt found in the southeast of England?
3 Name two areas of chalk hills in the UK.
4 Name a volcanic cone that can still be seen in the UK.

Extension

Visit the Geological Society's website (www.geolsoc.org.uk) to learn about the distribution of the UK's main rock types.

Review

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

- ✓describe the characteristics of the UK's main rock types
- ✓locate the main rock types on a map of the UK
- ✓understand the role of geology and past tectonic processes in the development of upland and lowland landscapes.

A number of physical and human processes work together to create distinct UK landscapes

LEARNING OBJECTIVE

To study the physical and human processes that have created the distinctive landscapes of the UK.

Learning outcomes

- To understand how distinctive upland and lowland landscapes result from the interaction of physical processes (glacial erosion and deposition, weathering and climatological processes, post-glacial river and slope processes).
- To recognise how distinctive landscapes result from human activity (agriculture, forestry, settlement) over time.

The upland landscapes of the UK could not be described as mountainous but they are very different from the lowland areas. The upland areas were formed by resistant rocks millions of years ago and their landscape has been defined by the physical processes at work during the last ice age. The UK has been covered by ice during ice ages on a number of occasions. The extent of the coverage during the last ice age, about 20,000 years ago, is shown on Figure 1.8 on page 7.

Since the last ice age, weathering, climate and other physical agents have had an impact on the landscape. The landscape has been shaped by the work of rivers (see page 26) and slope processes, such as mass movement (see page 27). The climate of the UK has also had an impact on the landscape. For example, heavy rainfall will cause rivers to have greater erosive power. Mechanical, biological and chemical weathering (see page 8) also have a continual impact on the landscape.

The lowland areas of the UK were shaped by glacial outwash. As the glaciers melted the water formed distinctive lowland landscapes. These landscapes have continually been shaped by rivers, weathering and slope processes, outlined in Chapters 2, 3 and 4.

These landscapes have also changed over time due to human activity. The building of settlements is perhaps the most distinctive change: houses, industries and roads connecting settlements have changed the landscape forever, with natural landscapes becoming human ones.

The agricultural landscape also continues to change. Originally the land was farmed with hedges and walls as field boundaries; as farming practices have changed over time, however, the hedges in some parts of the country have been removed and extensive areas of land have been created to allow for the large machinery that is now used. The landscape of the countryside, particularly in lowland areas, is continually evolving.

The landscape of the UK has also been influenced by forestry. Originally much of the UK was covered by **deciduous** woodland. Over hundreds of years the woodland has been felled, which has changed the landscape in a number of ways. Land that was once covered in trees is now open moorland, settlement and farmland. There has also been a change in the *type* of woodland in the UK, because much of the woodland which has been grown to replace the felled woodland is **coniferous**, not deciduous. In Scotland, the amount of woodland had decreased to four per cent of the landscape by 1900. The total is now back up to almost twenty per cent.

Figure 1.8 The extent of the ice sheet during the most recent glaciation – Devensian.

ACTIVITIES

1 Identify three agents of erosion that change the landscape.
2 Describe how rivers can change the landscape.
3 State three human activities that change the landscape.
4 Describe how farming has changed the landscape of the UK over the past 200 years.

Extension

Use the internet to research information about the last ice age. Try to answer the following questions.

1 What is meant by an ice age?
2 When was the last ice age?
3 Which areas of the UK were covered with ice?
4 What was the impact of the ice on the UK landscape of today?

Review

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

✓ understand how upland and lowland landscapes result from the interaction of physical processes
✓ recognise that distinctive landscapes can result over time from human activity.

Examination-style questions

1 Study Figure 1.7b on page 5. Identify the location of one area of schist landscape. (1 mark)
2 State one example of igneous rock. (1 mark)
3 State one characteristic of igneous rocks. (1 mark)
4 Forestry is a human activity that affects the landscape. Name one other human activity that affects the landscape. (1 mark)
5 Explain how that activity affects the landscape. (2 marks)

Total: 6 marks