Upland and lowland landscapes

On this spread you will compare the distribution of upland and lowland landscapes in the UK and how they were affected by glaciation.

Relief map of the UK

The relief map of the UK can be divided into upland and lowland areas (map C). Uplands, including mountainous landscapes like the Grampians and Pennines, are found mainly in the north and west, particularly Scotland, Wales and northern England (photo A).

Lowlands, including flat and rolling landscapes like the Cotswolds and South Downs (photo B), are found mainly in England, below an imaginary line from Flamborough Head in Yorkshire to the Bristol Channel.
What makes a landscape distinctive?

Glaciation in the UK

The UK landscape has not always looked like it does today. During the Quaternary period (see Chapter 2), much of Britain went through periods of glaciation, when the land was covered in ice. Over the 2.6 million years of the Quaternary period, the climate alternated between cold ice ages (glacial periods) and warm interglacial periods. The ice grew thicker and advanced over the land during the ice ages. It thinned and retreated during the interglacial periods (map D).

Glaciation made a lasting impression on the landscape. In upland Britain, the ice carved huge, U-shaped valleys and eroded steep mountain peaks and ridges. In non-glaciated lowland areas, periglacial conditions during the ice ages had an impact on the landscape (diagram E).

1. Look at map C.
   a. Name at least five mountainous upland landscapes in the UK.
   b. Name five lowland landscapes in the UK.

2. Look at photos A and B. Compare the two landscapes in upland and lowland UK. Mention:
   • the height and shape of the land
   • any surface water (or lack of it)
   • any vegetation cover (or lack of it).

3. Look at map D. Describe the distribution of:
   a. glaciated areas
   b. unglaciated areas.

4. Compare map D and panel E with photos A and B.
   a. Were the Cuillin Hills or South Downs ever covered by ice?
   b. Explain the impact of glaciation on the landscape in each photo.

Activities

Practice question

Describe the distribution of upland and lowland landscapes in the UK. (4 marks)
Life in the Arctic

Arctic location
The Arctic is the region north of latitude 60°N around the North Pole. It gives its name to the Arctic Ocean, which occupies most of the region. In winter the ocean is covered by sea ice (map A).

The Arctic marine ecosystem
Some people might think that nothing lives in the Arctic except polar bears, but polar bears must depend on other forms of life. They provide evidence of the Arctic ecosystem. In fact, polar bears sit at the top of a food chain that is part of the Arctic marine food web (diagram B).

Most of the species in the marine food web live in the ocean. The producers at the bottom of the food chain are microscopic plants called phytoplankton. They take energy from the Sun to convert carbon dioxide in the atmosphere into food. This energy is then passed up the food chain, via the consumers. On land, tundra supports another food web. When the snow melts, summer provides a short growing season. Plants are low-growing because of poor soils and have small leaves to reduce moisture loss because there is low rainfall (see spread 4.3). The plants and insects that emerge provide food for migrating animals like caribou and birds such as geese and ducks.
Arctic soils

In those parts of the Arctic where there is any soil at all, it is generally thin and of poor quality. Low temperatures mean that the underlying rock weathers slowly and few nutrients enter the soil.

Permafrost is another feature of Arctic soils. This is the part of the ground that remains permanently frozen all year. Even in areas of the Arctic where air temperatures rise above 0°C in summer, parts of the ground can remain frozen. The upper layer of soil that thaws in summer is the active layer. Further from the pole, as temperatures rise, this active layer becomes deeper (diagram C).

Arctic homes

Living in the Arctic presents many challenges for people. Traditionally, Inuit – the indigenous people of the Arctic – lived in tents when they were hunting in summer and built igloos in winter.

Now people live in modern buildings, adapted to Arctic conditions (photo D). Homes are built on stilts a metre or so above the ground. This is to prevent heat from the building melting the permafrost. If that happened, the ground would become soft, the foundations would collapse and the building would sink into the ground (photo E).

Activities

1 Look at map A. Name the countries that surround the Arctic Ocean.
2 Look at diagram B.
   a Name one example of each of these types of creature in the Arctic marine food web:
      • producer
      • primary consumer
      • secondary consumer
      • tertiary consumer.
   b Draw a diagram of the species in a food chain with the polar bear at the top.
   c Suggest why people might get the idea that nothing lives in the Arctic (apart from polar bears).
3 Identify the ways in which water is interdependent with the following.
   (Clue: remember ice is also water.)
   a Plants and animals
   b Soils
   c Human activity
4 Look at diagram C.
   a Describe what the terms ‘permafrost’ and ‘active layer’ mean.
   b Explain why they get deeper or thinner moving further from the North Pole.
5 Look at photo D. Try to explain each of these features of the buildings:
   a Buildings are on stilts.
   b Roofs slope steeply.
   c Windows are small.

Practice question

Describe the ways in which climate and soils are interdependent in the Arctic or Antarctic. (4 marks)