



General Certificate of Education
Advanced Level Examination
June 2010

Geography

GEO4B/PM

Unit 4B Geographical Issue Evaluation Advance Information Booklet

Date of Issue: 1 April 2010

In addition to this booklet you must have:

- the Ordnance Survey map extract (enclosed).

The Ordnance Survey map extract is not reproduced here due to third-party copyright constraints.

Instructions

- This Advance Information Booklet will be issued on 1 April 2010 in advance of the examination for Unit 4B. You should make yourself familiar with the information in the booklet.
- This material must be kept **unmarked** for use in the forthcoming examination.

STUDY ALL THE INFORMATION IN THIS BOOKLET

The information in this booklet comprises the following:

Item 1 What is a Geopark?

Item 2 North West Highlands Geopark – leaflet

Item 3 Extract from a walking guide to the Moine Thrust

Item 4 Extracts from the Mackay Country website (www.mackaycountry.com)

(a) Description of more recent geological processes

(b) Crofting

Item 5 Selected census data

Item 6 Ideas for further study

An Ordnance Survey map extract is also provided.

Item 1 What is a Geopark?

The North West Highlands Geopark lies in the Highland Region of Scotland and includes parts of the counties of Sutherland and Wester Ross. The park's eastern boundary generally follows the Moine Thrust Belt, one of its many notable geological features. Otherwise, the park is generally bounded by the north and west coasts of Scotland, with a few islands included in the park, such as the Summer Isles.

Awarded UNESCO Geopark status in 2004, it features some of the oldest rocks in Europe, around 3000 million years old. The area is one of the most sparsely inhabited in Europe and is largely treeless.

The International Network of Geoparks (INoG) is a UNESCO programme established in 1998. According to UNESCO, for a Geopark to qualify in the INoG, it needs to:

- have a management plan designed to foster socio-economic development that is sustainable (most likely to be based on agritourism and geotourism)
- demonstrate methods for conserving and enhancing geological heritage and provide means for teaching geoscientific disciplines and broader environmental issues
- have joint proposals submitted by public authorities, local communities and private interests acting together, which demonstrate the best practices with respect to Earth heritage conservation and its integration into sustainable development strategies.

The following material is taken from the North West Highlands (NWH) Geopark website.

At 3000 million years old, the rocks at the seashore are even older than the hills – and what hills they are! Where else can you experience a skyline that compares to the ridges of Foinaven and Arkle, or classic hills like Suilven or Stac Polly? In places like this it's not just the eagles or the peregrines that soar. This is the most sparsely populated corner of Europe. Set yourself free in a space with space to spare. Stunning mountain landscapes, clean sandy beaches, ancient settlements, thriving communities – NWH Geopark offers one of the best opportunities to explore wild places in Europe.

Whatever your interests and however you choose to travel, the Geopark has some fantastic activities and amenities on offer for everyone, all year round. Put together an itinerary that will please the whole family. Find a grocery store, a bookshop or a campsite close to a beautiful sandy beach. Discover more about the fascinating geology and natural heritage of NWH Geopark at award-winning visitor centres and local museums.

Find out more about the Geopark – who lives here, what impact geology has on our daily lives and what's on locally – or start searching for travel and visitor information by going straight to our website at <http://www.northwest-highlands-geopark.org.uk/index.html>

Turn over ►

Who lives in the Geopark?

Throughout the Geopark, traditional ways of living and working are very much a part of daily life. The largest centres of population are Lochinver, Kinlochbervie and Durness. Many settled areas follow the pattern of crofting communities.

A croft is a small agricultural unit averaging around five hectares in size together with some hill grazing shared with other local crofters. The main products of Highland crofts are lamb and beef, but many crofters are diversifying into other areas such as small-scale tourism, fruit and vegetable production, weaving or teleworking.

Crofting is fundamental to the area's heritage and a vital component in its future. Creating the conditions for a sustainable future has seen the introduction of a number of new technologies, including renewable and green energy initiatives as well as energy efficient housing.

What are the benefits of living in a Geopark?

Strong local involvement in sustainable development strategies brings its own benefits for the local community, and every Geopark will have its own unique approach to issues according to local priorities.

Thriving communities are vital to the ongoing viability of NWH Geopark. The aim is to carry out appropriate development which maximises current potential without compromising future possibilities for generations to come.

Further benefits include:

- opportunities for local businesses to diversify into tourism niche markets such as geotourism or the green tourism sector
- meeting increasing demand for locally produced food, clothing, arts and crafts
- better promotion of local events and activities to a wider audience
- development and marketing of local skills, knowledge and aspects of cultural heritage, eg traditional skills, music festivals, language learning opportunities
- new employment opportunities for local people with expertise in geosciences or geotourism.

To help you get around, North West Highlands Geopark is divided into four areas. Some of the must see attractions in and around Achiltibuie, Stac Polly and the Summer Isles:



Part of **Item 2** was a map of the Geopark. This map is not reproduced here due to third-party copyright constraints.

Coigach Community Hall Find a wealth of information on local heritage and community events. Home to a cafe and the local library, Coigach Community Hall provides opportunities for indoor sports and hosts exhibitions and events.

Falls of Kirkaig A twisting single track road leads you through a complicated landscape formed of ancient Lewisian Gneiss. The 20m falls are accessed by a path which also acts as an approach for climbing the mountain Sullers. In July or August you may see salmon leaping in the gorge below as you head to the falls.

Ben More Coigach & Cul Mor Shaped by glaciers and scarred by wind and weather, these peaks dominate the landscape around Achiltibuie.

Knockan Crag Visitor Centre Rock art, rock trails and the turf-roofed rock room make this a great destination for discovering more about the geology and natural history of the Geopark. Let the rocks around Knockan Crag tell the story of 3000 million years of history.

The Postie Path Stretching from Ullapool to the communities of Coigach, this is a challenging coastal walk taking in the rugged slopes of Ben More Coigach. The route was used by a very handy postman to deliver mail to the people of Coigach! Be aware that the Postie Path encompasses some difficult terrain.

- Native woodlands...**
- Ancient settlements...**
- Clean sandy beaches**
- Mountain landscapes...**

How do communities survive and flourish in one of the last great wilderness areas of northern Europe? North West Highlands Geopark offers a unique insight into life in an environment where the terrain is as beautiful as it is challenging.



Stac Polly Reach the 612m heights of Stac Polly by mountain path. Start from the car park on the banks of Loch Lurgainn and arrive among weathered sandstone pinnacles and gullies. Breathtaking views across the Minch. A circular path around the base of the cliffs offers an easier alternative route.

Inverpolly Forest Native woodland featuring birch, hazel and rowan species. Ideal area for bird and wildlife watching. From the path near Lameranach, discover a diversity of habitats against the backdrop of Torridonian sandstone mountains.

The Summer Isles A popular area for sea kayaking, diving and island cruises. Take a trip to Tanera Mor, the only inhabited island in the Summer Isles archipelago. There are no roads on the island – but you may be lucky and see otter tracks! Visit the post office famous for printing its own stamps since 1970.

Achnahaird Sands The perfect family camping site with views to the north, this long sandy beach lies close to the scenic village of Achiltibuie and the attractions of the Achiltibuie Smokehouse and The Hydroponicum. Sand dunes hide an important archaeological site while the coastline offers low level walks with interesting geological features.

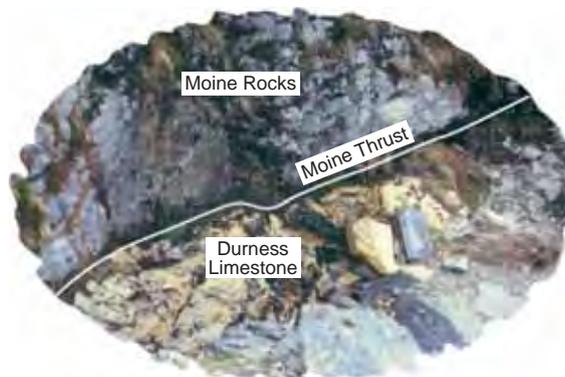
Food for thought

Support good quality local food and drink, a core of the highlights of traveling. Visit your own shops with a nod and a smile, it's your thing or you simply love a change, why not browse the wide range of products available at outlets such as the Achiltibuie Smokehouse. Here, you can buy organic smoked salmon, smoked meat and game, delicious marmalades and Scottish cheeses. Look out for locally grown fruit and vegetables as well as tempting jams and pickles at farmers markets and community shops. If you choose to stay in self-catering accommodations, ask about local vegetable box schemes and the availability of farm fresh eggs or locally reared meat.

Item 3 Extract from a walking guide to the Moine Thrust

A booklet produced for the Geopark describes a walk to Knockan Crag (OS Grid Reference NC 188092 – but not shown on the map extract provided). Along this walk there are good opportunities to see landforms produced by the Moine Thrust. The following extract describes part of the Moine Thrust and explains how the Thrust was formed.

Climb up to the signposted Moine Thrust, where you can bridge 500 million years with your hands. At the base of the cliff is the 500 million year old Durness Limestone, which is here weathered to a pale, creamy colour – although the freshly cut surfaces set in the path are a dark grey shade. In contrast, the cliffs above you are made from grey Moine Rocks that are about 1000 million years old. Note that there is very little lichen on the Durness Limestone, whereas the Moine Rocks are covered in lichen: few lichen species grow on limestone.



The Moine Thrust

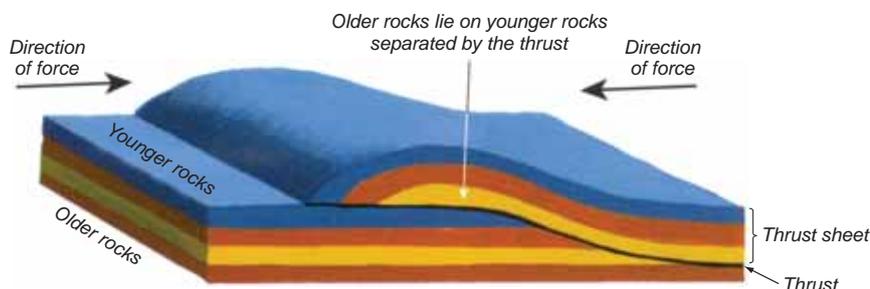


Dark Moine Rocks on top of creamy Durness Limestone, separated by the Moine Thrust

The confusing paradox of Knockan is that at first glance this looks quite normal, just one rock on top of another. The problem is that the Moine Rocks above the limestone are not younger than the limestone, but are twice as old! The boundary between these two rocks is not a normal geological contact but is in fact the famous Moine Thrust. The Moine Rocks have been thrust tens of kilometres from the east to their present resting place on top of the limestone. On closer inspection, the effects of this huge thrusting event can be seen in the limestone, which is full of cracks, formed as the thick pile of Moine Rocks was forced over it, more than 400 million years ago.

But what is a thrust? When two continents collide, the rocks at the edges of the continents are squeezed and crumpled, leading to the formation of a mountain range.

As the layers of rock deep within a mountain range are squeezed, they eventually break, and thick slices of rock slide over each other. The surfaces along which the rocks slide are called thrusts, and the moving slices of rock above the thrusts are called thrust sheets.



Picture a snow plough clearing the streets: as the plough moves the snow, slabs of old snow are thrown over younger snow in front, and this is exactly what happens in mountain ranges. So as two continents plough further into each other, one thrust sheet after another develops, and older rocks are thrust over younger rocks. Long after the mountain range has disappeared, thrusts can be recognised because of this sequence of older rocks on top of younger. The rocks at Knockan once lay deep within the ancient Caledonian Mountain Range, and the Moine Rocks are separated from the younger Durness Limestone below by the Moine Thrust.

Item 4 Extracts from the Mackay Country website (www.mackaycountry.com)

The area described as 'Mackay Country' on this website overlaps to a considerable extent with the Highland Geopark. It lies in the extreme northwest of Scotland and is the traditional home of the Clan Mackay. The following extracts from the website describe (a) the glacial and post-glacial processes that affected the area, and (b) the way of life of the crofters in the area.

(a) Description of more recent geological processes

The Ice Ages lasted for some 2.4 million years and during that time ice cover came and went periodically. Ice gathered in north-facing hollows in the hills and created the classic corries to be seen today in the mountains. The slow-flowing glaciers gathered debris on their descent, which helped to scour slopes and gouged out U-shaped valleys like Strath Halladale, Strathnaver, Strath More and Strath Dionard. On the coast, the legacy of the glaciers can also be seen in the sea lochs like Eriboll, Inchard, Glen Coul and Glendubh. In Norway these would be called fjords.

When the glaciers began to melt, they released huge amounts of meltwater. These rapid, fast flowing, debris-filled burns and rivers were short-lived but they made their mark. The deep gorge through which the Armadale Burn now flows was cut by glacial meltwater. Many hundreds of tonnes of outwash gravels and sands were washed down the straths. Some went out to sea and the remainder can be seen as a series of terraces by which it is possible to trace past courses of the rivers. On the shoreline are more terraces and raised beaches about twelve metres above current sea level. Once the weight of the ice was lifted from the land as it melted, the land itself rose up creating raised beaches. These flat, relatively fertile places have always been crucial to crofting for crops and grazing.

(b) Crofting

There are 706 crofts and some 478 crofters in Mackay Country. About 40% of resident households have a croft but absentee rates are as high as 33%. Returns from agriculture have been falling in recent years. It is likely that the Common Agricultural Policy reform will put further pressure on crofting, as small-scale production will struggle to survive under new market conditions despite production of good quality, hardy animals through low intensity methods. Crofting remains a mainstay of Mackay Country communities in terms of social cohesion, communal working and cultural contribution, including maintaining the Gaelic language.

A **croft** is a small unit of land situated in the Highlands and Islands of Scotland, and held subject to the provision of the Crofters (Scotland) Act 1993.

A **crofter** is normally the tenant of a croft and pays rent to the landlord of the croft. Rent is paid for the land only, as any house, agricultural building, fence, etc, is provided by and owned by the crofter.

An **owner-occupier** is a tenant of a croft who has exercised the right to purchase the croft from the landlord and continues to live on the croft.

Many mistake crofting for small-scale farming. This is clearly far too narrow a view and understates the immense influence crofting has on the everyday lives of people in communities in crofting areas. While agriculture has its place, generally crofters either obtain the bulk of their income from other full-time or part-time employment, or are retired. The average size of a croft is around 5 hectares (ha), but some are only 0.5 ha while a few can extend to 50 ha of land, plus a share in hill grazing which is held in common with other crofters in a township.

Agriculturally, virtually all of the land in the Highlands and Islands is classified as Severely Disadvantaged in terms of the Less Favoured Area Directive. The existence of crofting has helped to retain viable rural communities by providing low cost land and housing as a basis for other economic activity. Crofting communities are increasingly looking to reorganise croft land, create new crofts and, in many cases, utilise the land available to the good of the wider community. Any future scheme will continue to meet the needs and concerns of modern crofting and play a vital role in ensuring crofting continues to play an active role in the fabric of rural Highland life.

Crofting has always been important in keeping communities alive as it helps people to live and work in some of the most remote areas of the Highlands and Islands. It also helps to keep rural schools and other vital public services operating in these areas. Croft land also provides environmental benefits and a varied habitat for wildlife. Traditionally, crofters use low amounts of chemical fertilisers, weed killers and insect sprays. As a result, the range of plants is much wider than on more intensively managed areas. Many tourists come to the Highlands and Islands attracted by its natural beauty and the richness of its wildlife. The crofting system is a key part of this environment. Organisations like Scottish Natural Heritage and the Royal Society for the Protection of Birds work with crofters to protect these habitats. Crofting plays a vital role in sustaining fragile rural communities, a unique culture and a richly varied environment.

Item 5 Selected census data

The tables in Item 5 are from the Scottish Census.

The first set of data (**Figure 3**) applies to the Highland Region as a whole. The region is shown in **Figure 1**.

The second set of data (**Figure 4**) applies to one small area within the Highland Region, Lochinver and its surrounding area. This area is shown in **Figure 2**.

Figure 1**Map to show location of Highland Region**

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Figure 2

Map to show location of the Data Zone SO1003967 around Lochinver

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Figure 3
Selected Census Data

Table 1a – Age Structure

		Percentage of people aged												Mean age of population in the area				
		0–4	5–7	8–9	10–14	15	16–17	18–19	20–24	25–29	30–44	45–59	60–64	65–74	75–84	85–89	90 & over	
All people	5 062 011	5.47	3.54	2.53	6.38	1.29	2.50	2.48	6.21	6.27	22.97	19.39	5.17	8.81	5.34	1.17	0.58	
Highland	208 914	5.44	3.63	2.62	6.60	1.33	2.62	1.85	4.78	5.39	22.03	21.44	5.66	9.30	5.45	1.23	0.61	
																		38.97
																		40.02

Table 1b – Country of Birth

		Percentage of people born in						Elsewhere
		England	Scotland	Wales	Northern Ireland	Republic of Ireland	Other EU countries	
All people	5 062 011	8.08	87.13	0.33	0.66	0.43	0.88	
Highland	208 914	13.70	82.19	0.52	0.46	0.27	0.93	
							2.50	
							1.94	

Table 1c – Employment

		Percentage of people aged 16–74 in employment working in														
		Agriculture, hunting and forestry	Fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Wholesale & retail trade, repair of motor vehicles	Hotels and catering	Transport, storage & communication	Financial services	Real estate, renting and business activities	Public administration and defence	Education	Health and social work	Other
All people aged 16–74 in employment	2 261 281	2.14	0.30	1.24	13.23	1.00	7.48	14.39	5.74	6.70	4.64	11.17	6.99	7.30	12.37	5.31
Highland	97 190	3.74	1.45	1.34	9.11	1.04	9.18	14.65	9.33	7.14	2.04	9.87	6.78	6.62	12.43	5.28
of which:																
Males	52 188	5.55	2.40	2.40	12.35	1.60	15.88	12.79	6.45	9.67	1.70	10.49	6.46	3.21	4.15	4.90
Females	45 002	1.64	0.34	0.11	5.36	0.40	1.42	16.81	12.66	4.21	2.43	9.15	7.14	10.59	22.03	5.72

Figure 4

Key data for Data Zone SO1003967 (Lochinver and surrounding area, shown in **Figure 2**).

	Data Zone SO1003967	Highland Region	Scotland
Population (2005)			
Total population	491	215 310	5 116 900
Total population aged 16–19	15	9 890	262 956
% children	16.29	18.30	18.02
% working age	64.77	60.84	62.78
% pensionable age	18.94	20.86	19.20
Economic Activity and Benefits (2005)			
% of total population who are income deprived	9.0	11.3	13.9
% of population aged 16–24 claiming Jobseeker's Allowance: Q4 ¹	0	4.1	4.2
% of population aged 25–49 claiming Jobseeker's Allowance: Q4	2.8	2.1	2.5
% of population aged 50 to pensionable age claiming Jobseeker's Allowance: Q4	0	2.1	1.9
% of working age population who are employment deprived ²	10.4	10.6	12.9
Education (2007)			
Total number of pupils in primary schools	34	16 943	373 314
Total number of pupils in secondary schools	43	14 871	307 885
Housing			
Total number of households: 2001	239	89 533	2 192 246
% of households – owned: 2001	52.72	65.75	62.59
% of households – social rented: 2001	26.36	23.12	29.41
% of households – private rented: 2001	20.92	11.13	8.00
% of dwellings in Council Tax band A: 2007	28.62	18.25	23.09
% of dwellings in Council Tax bands A to C: 2007	75.52	59.00	62.79
% of dwellings in Council Tax bands F to H: 2007	8.28	10.71	11.82
Number of dwellings per hectare: 2007	0.01	0.04	0.31

Access to Services (Average times)	Time (minutes)
Drive time to a GP: 2007	5.5
Drive time to a Post Office: 2007	4.8
Drive time to a supermarket: 2003	8.8
Public transport time to a GP: 2006	20.5
Public transport time to a Post Office: 2006	48.3
Public transport time to shopping facilities: 2006 ³	141.9

¹ Q4 – 4th quarter of 2005

² employment deprived – those on Jobseeker's Allowance and others seeking work

³ this refers to the type of shopping facilities found in a large town, often referred to by geographers as 'comparison shops'

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Item 6 Ideas for further study

You can find out more about the area that lies within the North West Highlands Geopark at the following websites:

- <http://www.northwest-highlands-geopark.org.uk/geopark/index.html>
- <http://www.mackaycountry.com/index.htm>

You should also consider how you might carry out fieldwork to investigate at least **one** of the following in the area shown on the OS map extract:

- the changing characteristics of the River Kirkaig and its valley between 120177 and 078194
- the characteristics of raised beaches around Loch Kirkaig, grid square 0719
- the evidence of glacial movement in the area around Fionn Loch.

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