



## Higher National Unit specification

### General information for centres

**Unit title:** Geology and Geomorphology

**Unit code:** F3SL 34

**Unit purpose:** This Unit provides an introduction to geology and geomorphology. It will provide candidates with the knowledge to understand the physical landscape around them and the processes which created it. This Unit will support candidate studies in other areas such as Ecology, Heritage and Countryside Management and Habitat Management.

On completion of the Unit the candidate should be able to:

- 1 Describe geological processes and the structures they produce.
- 2 Describe geomorphological processes and formations they produce.
- 3 Describe the development, properties and occurrence of soils.

**Credit points and level:** 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7\*)

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

**Recommended prior knowledge and skills:** Access to this Unit is at the discretion of the centre. There is no recommended prior knowledge or skills required for undertaking this Unit, but an interest in geology would be useful.

**Core Skills:** There are opportunities to develop the Core Skills of *Communication* at SCQF level 6 and *Problem Solving* and *Working with Others* in this Unit at SCQF level 5, although there is no automatic certification of Core Skills or Core Skills components.

**Context for delivery:** If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

**Assessment:** Each Outcome could be assessed independently. Alternatively the Unit could be assessed using an investigation of a site to cover all three Outcomes, or two assessments used, one to cover the assessment of Outcome 1 and Outcome 2 and the other to cover the assessment of Outcome 3. Outcome 1 must also include a practical rock identification section involving field identification of two different rock types and laboratory identification of four rock types.

## **Higher National Unit specification: statement of standards**

**Unit title:** Geology and Geomorphology

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### **Outcome 1**

Describe geological processes and the structures they produce

#### **Knowledge and/or Skills**

- ◆ Rock formation
- ◆ Rock types
- ◆ Plate tectonics
- ◆ Rock identification

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ describe the processes which create igneous, sedimentary and metamorphic rocks
- ◆ describe plate tectonics and two geological structures created from this process
- ◆ carry out field identification of two different rock types and laboratory identification of four rocks in hand specimens, using key identification books

#### **Assessment Guidelines**

This Outcome could be assessed in conjunction with Outcome 2, or in conjunction with Outcomes 2 and 3.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Geology and Geomorphology

### **Outcome 2**

Describe geomorphological processes and the formations they produce

#### **Knowledge and/or Skills**

- ◆ Geomorphology
- ◆ Environments
- ◆ Land Forms

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ describe the geomorphological processes of weathering, erosion, transport, denudation and deposition and give an example of each from fluvial, glacial or coastal environments
- ◆ describe two example of landform created by geomorphological processes

#### **Assessment Guidelines**

This Outcome could be assessed in conjunction with Outcome 1, or in conjunction with Outcome 3.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Geology and Geomorphology

### **Outcome 3**

Describe the development, properties and occurrence of soils

#### **Knowledge and/or Skills**

- ◆ Soil formation
- ◆ Factors affecting soil formation
- ◆ Soil profile characteristics
- ◆ Soil classification

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ describe the soil forming processes of translocations and transformations
- ◆ describe the effects of the following factors on soil formation:
  - soil parent material
  - climate
  - topography
  - organisms
  - time
- ◆ describe soil profile characteristics of texture; drainage status; colour; chemistry; horizons
- ◆ classify soils in terms of their profile characteristics and texture

#### **Assessment Guidelines**

This Outcome could be assessed on its own or in conjunction with Outcomes 1 and 2 as part of an integrated assessment investigating the geology, geomorphology and soils of a site.

## Administrative Information

**Unit code:** F3SL 34  
**Unit title:** Geology and Geomorphology  
**Superclass category:** RF  
**Original date of publication:** August 2008  
**Version:** 01

### History of changes:

Version	Description of change	Date

**Source:** SQA

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## Higher National Unit specification: support notes

### Unit title: Geology and Geomorphology

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

### Guidance on the content and context for this Unit

The Unit aims to provide candidates with an understanding of internal and external earth processes which play an important role in shaping the environment in its widest sense; from the physical structure of the land around us to the development of ecosystems and habitats within this. The broad scope of this Unit is deliberate and provides underpinning knowledge to support many areas such as ecology, heritage and countryside management and habitat management.

The term Geodiversity has become increasingly more common place within the countryside management (conservation) sector and there has been a recent upsurge of interest and support in geodiversity from government agencies such as Scottish Natural Heritage (SNH), Natural England and the Joint Nature Conservation Committee (JNCC) or their current equivalents. This had led to the development of geodiversity action plans across many areas of the UK including Scotland's first in West Lothian. With this additional interest and support within the sector, it is important for candidates to understand the basic processes and resulting formations which the term encompasses. It is important that candidates are introduced to the importance of the links between geodiversity and biodiversity, that they are complimentary concepts and not mutually exclusive. As such, this Unit covers all aspects of geodiversity: Outcome 1 addressing the effects of internal earth processes; Outcome 2 builds upon this to look at how external earth processes are continually imprinting on the earth's surface; and finally Outcome 3 seeks to look at how some of the sediments derived from the processes of Outcome 1 can become soils and how once again, a range of interacting factors will produce a wide range of different soils.

It is important for candidates to be able to describe not only the processes but also how these processes act upon the earth to produce the many different landforms which create the basic fabric of the UK landscape today.

#### Outcome 1

This part of the Unit could introduce candidates to the three main rock types, igneous, sedimentary and metamorphic and explore the processes leading to their formation. Candidates may be made aware of the links between these rock types in terms of the rock cycle and how this is driven by plate tectonics and the geomorphological processes covered in Outcome 2.

The formation of igneous, sedimentary and metamorphic rocks could cover the following:

- ◆ Igneous — rocks produced by the partial melting of the mantle, melting of crustal material at subduction zones, melting of the lower crust in mountain chains
- ◆ Sedimentary — rocks created by the accumulation and subsequent burial and compression of sediments and the cementing of particles leading to lithification
- ◆ Metamorphic — rocks created by thermal, regional and dynamic metamorphism and the textures that each of these processes develop in rocks

## Higher National Unit specification: support notes (cont)

### Unit title: Geology and Geomorphology

Studying some rock samples and developing skills in identifying and describing them will assist candidates in understanding the processes leading to their formation. Rock specimens might include: Granite, rhyolite, gabbro, dolerite, basalt, andesite, sandstone, shale, limestone, conglomerate, slate, gneiss, schist, marble, quartzite or others relevant to the candidates area of study or local geology.

Plate tectonics could cover destructive, constructive and conservative plate boundaries and the geological structures associated with them — continental shelf, mid oceanic ridges, ocean basins. Faulting, folding and vulcanism and effects such as the creation of fold mountain chains, rift valleys and volcanic activity, could be investigated in relation to the varied landscape of Scotland and the UK today.

#### Outcome 2

This part of the Unit is very important in terms of candidates being able to recognise landforms — river terraces, dunes, cliffs, moraines — in the classroom setting and in the field and identify and describe the processes which created them. Candidates' awareness could be raised of the fundamental concept that the processes which are active at the earth's surface today were active at the earth's surface in the past, essentially 'the present is the key to the past'. It is this concept that has enabled geologists and geomorphologists to map and understand ancient environments and climate.

Weathering, transport and erosion could be covered as a way of introducing candidates to the concepts of **denudation** and deposition, which in turn lead to the large scale accumulation of sediments which, in turn lead to the development of thick sequences of sedimentary rocks. Outcome 2 builds on the Outcome 1 in enabling candidates to assess for themselves those areas of the earth's surface which are more prone to erosion and those areas which are more resistant.

#### Outcome 3

Understanding the development, properties and occurrence of soils is important for candidates in the context of the Group Award. This part of the Unit explores how mineral based sediments which accumulate as a result of weathering and erosion in a terrestrial setting, transform into soils which support a vast majority of the terrestrial biota. Understanding soil development, properties and occurrence is important within the Group Award in terms of aiding the understanding of ecosystems, the landscape, land use, habitats within the landscape and in turn the heritage of those that live within the landscape.

### Guidance on the delivery and assessment of this Unit

This Unit provides underpinning knowledge for a range of Units within the Countryside Management Group Award including DN37 34 *Ecology and Ecosystems* and D5E6 34 *Understanding the Landscape*. During delivery local and national examples could be used to illustrate both processes and formations. Where possible, local field visits could be undertaken to help put learning in context.

Rock identification in the laboratory, could cover at least one specimen from each of the three major groups of rocks. The specimens identified in the field will be dependent on the geology of the study area used to assess Outcome 1.

## Higher National Unit specification: support notes (cont)

### Unit title: Geology and Geomorphology

It is recommended that time is spent in the class for students to familiarise themselves with a range of hand specimen samples and simple methods used to identify them such as keys, books and internet resources. The range of rock samples studied could be based around the geology of the local area or by sites visited by candidates throughout the course of their studies. This will help contextualise the Unit within the Group Award framework and it is anticipated that some practice of rock identification work is carried out in the field and laboratory as this will help candidates to better understand the landscape and its formation by relating extant features to the underlying geology. The presence of different rock types in the landscape can also be used to help understand the distribution of some habitats and their associated flora and fauna.

Links between geodiversity and biodiversity could be highlighted in the delivery of this Unit as well as the effects of geological and geomorphological processes on the landscape of today.

An awareness of the range of environments in which geomorphological processes have acted during the last 2.5 million years should be developed. The features and processes to be assessed will be dependent on the chosen area of study for the assessment of this Outcome.

Outcome 3 of this Unit could again be delivered through a mixture of classroom sessions and supporting field visits and supported by field visits and investigations. Again, the use of local examples would help to support the delivery of this Outcome.

The assessment of this Unit could be based on a single assessment based on the study and investigation of a single site to cover all 3 Outcomes, or two assessments could be used 1 to cover the assessment of Outcome 1 and Outcome 2 and one to cover the assessment of Outcome 3.

### *Opportunities for developing Core Skills*

There are opportunities for developing the Core Skills of *Problem Solving*, *Working with Others* at SCQF level 5 and *Communication* at SCQF level 6 although there is no automatic certification of Core Skills or Core Skills components. These opportunities could occur during delivery through group work and field trips, whilst undertaking site investigations into the geology, geomorphology and soils found. Additional research to support lectures and sites visits and the use of identification keys and books support the development of the *Communication* components.

### Open learning

Elements of this Unit could be delivered via distance learning or indeed via a flexible learning approach. Certain aspects though, such as the opportunity to undertake site visits under the guidance of a tutor or the ability to exchange views with one's peer group might be better undertaken as organised learning episodes.

### Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).



## General information for candidates

### Unit title: Geology and Geomorphology

This Unit provides you with an introduction to geology and geomorphology which together make up geodiversity. The Unit aims to provide you with an understanding of internal and external earth processes which play an important role in shaping the environment in its widest sense; from the physical structure of the land around us to the development of ecosystems and habitats within this.

The Unit covers all aspects of geodiversity: Outcome 1 addressing the effects of internal earth processes; Outcome 2 builds upon this to look at how external earth processes are continually imprinting on the earth's surface; and finally Outcome 3 seeks to look at how some of the sediments derived from the processes of Outcome 1 can become soils and how once again, a range of interacting factors will produce a wide range of different soils.

It is important for you to be able to describe not only the processes but also how these processes act upon the earth to produce the many different landforms which create the basic fabric of the UK landscape today.

The assessment of this Unit could be based on a single assessment based on the study and investigation of a single site to cover all 3 Outcomes, or two assessments could be used 1 to cover the assessment of Outcome 1 and Outcome 2 and one to cover the assessment of Outcome 3.

There are opportunities to develop your Core Skills in *Communication* at SCQF level 6 and *Problem Solving* and *Working with Others* at SCQF level 5. These opportunities could occur during delivery through group work and field trips; on site investigations into the geology, geomorphology and soils found; additional research to support lectures and sites visits and the use of identification keys and books.